NLGI Spokesman

Journal of National Lubricating Grease Institute

the case of

THE GREASE THAT STARTED YIELDING

bigger profits

and how **MALLINCKRODT** helped a company cut soap costs over 30%

A progressive grease manufacturer was worried. Production costs were cutting deeper and deeper into the profit margin on a big volume aluminum grease.

He submitted samples of his oil to Mallinckrodt. Our technical men found the grease could be **duplicated with a more economical formula** . . . using High Efficiency Stearate D-51 blended with Aluminum Stearate D.

That solved the problem because: (1) The superior gelling power of D-51 permitted him to make his grease with approximately one-third less soap; (2) Quality of his grease was maintained.

Results: Lower production costs . . . a substantial raise in the profit margin.

Moral: Take advantage of our technical know-how and years of experience . . . perhaps we can save you untold dollars.

Over 30 years of grease making experience is available to you at Mallinckrodt. If you have a problem, we'll be glad to help you in any way possible. Write or call.

Mallinckrodt®

MALLINCKRODT CHEMICAL WORKS

Mallinckrodt St., St. Louis 7, Mo. 72 Gold St., New York 8, N. Y.

CHICAGO • CINCINNATI • CLEVELAND • LOS ANGELES • MONTREAL • PHILADELPHIA • SAN FRANCISCO

Manufacturers of Medicinal, Photographic, Analytical and Industrial Fine Chemicals

Lubricating Grease Technologist Wanted

Must have actual working experience in manufacture of highest quality and latest type lubricating greases and be competent to supervise production of same.

Applicant should be familiar with most up-to-date grease-making methods and preferably have engineering degree as well as practical knowledge of subject. Should be able to work with outside laboratories and Sales Department in technical capacity.

Long-established grease manufacturer offers exceptional opportunity to competent man. Salary $12,000. Applicant should furnish complete resume, including age and references. Box 643, NLGI Spokesman.

A LUBRICANT for every purpose

Whether it's greasing junior's racer, or a mighty locomotive, DEEP ROCK has greases and lubricants that fill the bill. Let DEEP ROCK's ultra-modern refining facilities supply you today!

DEEP ROCK

DEEP ROCK OIL CORPORATION

Atlas Life Bldg. Tulsa, Oklahoma

HARSHAW LEAD BASE

Harshaw Lead Base, as an additive to petroleum lubricants, improves extreme pressure characteristics and imparts the following desirable properties:

- **Increased film strength**
- **Increased lubricity**
- **Improved wetting of metal surfaces**
- **A strong bond between lubricant and metal surfaces**
- **Resistance to welding of metals at high temperatures**
- **Moisture resistance and inhibits corrosion**

Harshaw Lead Bases are offered in three concentrations to suit your particular needs:

Liquid	Liquid	Solid
30% Pb	33% Pb	36% Pb

Other metallic soaps made to your specifications. Our Technical Staffs are available to help you adapt these products to your specific needs.

THE HARSHAW CHEMICAL CO.

1945 E. 97th Street • Cleveland 6, Ohio

Branches In Principal Cities

Grease Technologist Available

WANTED: A supervisor's position, willing to relocate. Capable of supervising the manufacturing of latest types of greases and grease making techniques, including grease additives, cutting oils, etc. Twenty-three years of actual working experience in grease making and allied products. Majored in Chemistry. Capable of working with sales people and trouble shooting for them. References available. Box 576, NLGI Spokesman.

RESEARCH CHEMIST

Permanent position in eastern research and development laboratory of established concern developing basically new grease formulation. Seeking man to work at project level. Opportunity for advancement. Prefer three to five years experience in formulation, testing, or manufacture of grease. Substantial salary and liberal company benefits. Please send complete resume of professional and educational history. Box 109, NLGI Spokesman.

ALL READERS OF "NLGI Spokesman" should ALSO read

Scientific LUBRICATION

AN INDEPENDENT MONTHLY JOURNAL DEVOTED EXCLUSIVELY TO LUBRICANTS AND LUBRICATION

ANNUAL SUBSCRIPTION $5.00

Post free anywhere in the world

JUST PUBLISHED

"Lubricant Testing"

by E. G. Ellis, B. Sc., F.I. Pet.

This book describes the most recent developments in testing technique, it introduces and illustrates methods for testing grease and oil hitherto unpublished in any book. The author is a leading British grease chemist. 232 pages 9" x 6".

PRICE $6.00 Including free registered mail anywhere in world.

ORDER NOW You may remit by check on your own bank or by International M.O.

To Scientific Publications (G. B.) Ltd.
8 Walker Street
Wellington, Shropshire, England

☐ Please send Scientific Lubrication for one year commencing with current issue

☐ Please send a copy of Lubricant Testing

Name_____

Address_____

_____

☐ Remittance for $_____ enclosed

☐ Please bill me

stop costly screen clogging

Here's how Santolene H helps you:

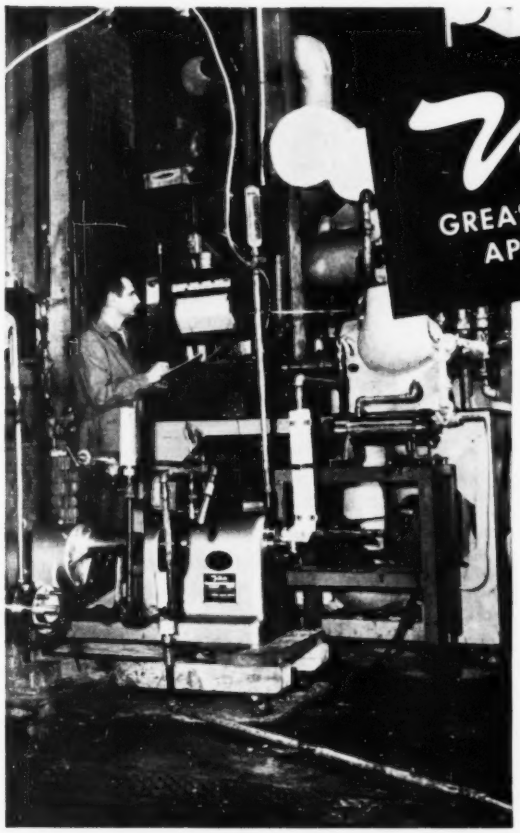
- **ELIMINATES FOGGING** caused by formation or stabilization of fuel oil-water emulsions, since it has a *nonmetallic base.*
- **KEEPS FUEL OIL SLUDGE AND SEDIMENT LOW** by inhibiting progressive polymerization of unstable elements initially present in oil.
- **REDUCES DEPOSITION** of sludge and sediment on burner parts by means of a unique surface action.
- **INHIBITS RUST** and eliminates nearly all entrained rust at fuel oil burner.

Santolene: Reg.U.S. Pat. Off.

SANTOLENE H

FOR MORE INFORMATION *send for Technical Bulletin O-87. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 800 North Twelfth Blvd., St. Louis 1, Missouri.*

MONSANTO
CHEMICALS / PLASTICS
SERVING INDUSTRY... WHICH SERVES MANKIND



Use our

continuous processing know-how

THIS PILOT plant operation at Girdler is an example of our development of continuous processes for a variety of grease products. Fast, continuous cooking and cooling assures uniformity, permits close control of moisture content and temperature, eliminates pan cooling.

Our pilot plant and laboratory facilities are available to you for study of new processes and equipment, and research on new applications. Use our experience—write The Girdler Company, Votator Division, Louisville 1, Kentucky.

*VOTATOR—Trade Mark Reg. U. S. Pat.

The GIRDLER Company
A DIVISION OF NATIONAL CYLINDER GAS COMPANY
VOTATOR DIVISION

GULF

A Complete Line of Quality Oils and Greases

★

GULF OIL CORPORATION — GULF REFINING COMPANY

DIVISION SALES OFFICES
Boston — New York — Philadelphia
Atlanta — New Orleans — Houston
Toledo

REFINERIES
New York, N. Y. — Philadelphia, Pa.
Pittsburgh, Pa. — Toledo, O. — Cincinnati, O.
Port Arthur, Tex. — Fort Worth, Tex.
Sweetwater, Tex.

President's page

by W. Wayne Albright, President, N L G I

NLGI PROGRESS

Before the next issue of the Spokesman is printed, a new President will have been elected. The present incumbent has been in office one pleasant and profitable year (his evaluation). Since his first "President's Page" a year ago dealt with "NLGI Progress," and pointed with pride to the accomplishments prior to last year's election of officers, perhaps it would be appropriate for him to review briefly the highlights of progress made during his own term of office.

Total membership has increased approximately 6%. The Active Members of NLGI manufacture about 95% of the lubricating greases produced in this country. Active Members also include several from foreign countries. Associate Members include suppliers of ingredients, equipment, containers, technical and research organizations. By means of a change in the Constitution and Bylaws, it is now possible to admit Marketing Members in a separate classification. A program to render service to Marketing Members is being developed.

Distribution of the Spokesman to colleges and universities is being reviewed to assure its reaching the chemical and engineering divisions. It is believed this will encourage students to consider the lubricating grease industry as their vocation. Likewise, the Spokesman itself continues its year to year improvement under the editorship of the Executive Secretary.

The accomplishments of the Technical Committee are too numerous to be detailed here. Several subcommittees, however, warrant special mention. These include The Joint API-NLGI Container Committee, the Subcommittee on Recommended Practices for Packing Automotive Front Wheel Bearings, the Subcommittee on Delivery Characteristics of Dispensing Equipment for Lubricating Greases, the Joint Committee on Lubricating Greases for Railroad Antifriction Journal Bearings, etc., etc. The work of this latter committee is possibly the greatest contribution NLGI has ever made to the railroads, bearing manufacturers, and lubricating grease manufacturers.

The page you are now reading is the "swan song" of this year's President. The President, therefore, has something very personal to say. He wants you to know that it has been a genuine privilege and pleasure for him to serve as NLGI's 20th President. He feels that the cooperation he has received from the officers, directors, executive secretary, committee chairmen and members is unmatched in many trade associations and excelled in none. It is therefore easy for him to predict that the present high standard of cooperation accorded him will continue in the future and that the Institute will go on building and strengthening in new ways its already high position of leadership.

Very best wishes to the new officers, all NLGI members and friends.

Published monthly by
National Lubricating Grease Institute
Harry F. Bennetts, *Editor*
Joanne Couey, *Assistant Editor*
4638 J. C. Nichols Parkway
Kansas City 12, Mo.

1 Year Subscription $2.50
1 Year Subscription (Foreign) ..$3.25

NLGI Spokesman

Vol. XVII OCTOBER, 1953 No. 7

OFFICERS

President: W. W. Albright, Standard Oil Company (Indiana), 910 S. Michigan, Chicago, Ill.
Vice-President: G. A. Olsen, Sunland Refining Corp., P. O. Box 1512, Fresno, Calif.
Treasurer: A. J. Daniel, Battenfeld Grease and Oil Corp., 3148 Roanoke Road, Kansas City, Mo.
Executive Secretary: Harry F. Bennetts, 4638 J. C. Nichols Pkwy., Kansas City, Mo.

DIRECTORS

W. W. Albright, Standard Oil Company (Indiana), 910 S. Michigan, Chicago, Ill.
M. R. Bower, Standard Oil Company of Ohio, Midland Bldg., Cleveland 15, Ohio.
R. Cubicciotti, L. Sonneborn Sons, Inc., 300 Fourth Avenue, New York, N. Y.
A. J. Daniel, Battenfeld Grease and Oil Corp., 3148 Roanoke Rd., Kansas City, Mo.
H. L. Hemmingway, The Pure Oil Company, 35 E. Wacker Drive, Chicago, Ill.
H. P. Hobart, Gulf Oil Company, Gulf Building, Pittsburgh, Pa.
C. B. Karns, Esso Standard Oil Company, 34th and Smallman, Pittsburgh, Pa.
J. W. Lane, Socony-Vacuum Oil Company, Inc., 26 Broadway, New York 4, N. Y.
H. A. Mayor, Jr., Southwest Grease and Oil Co., 220 W. Waterman, Wichita, Kans.
L. W. McLennan, Union Oil Co. of Calif., Research Dept., P.O. Box 218, Brea, Calif.
G. E. Merkle, Fiske Brothers Refining Co., 129 Lockwood Avenue, Newark 5, N. J.
W. M. Murray, Deep Rock Oil Corporation, P. O. Box 1051, Tulsa 2, Okla.
G. A. Olsen, Sunland Refining Corp., P. O. Box 1512, Fresno, Calif.
F. E. Rosenstiehl, The Texas Company, 135 East 42nd Street, New York 20, N. Y.
W. H. Saunders, Jr., International Lubricant Corporation, New Orleans, La
H. B. Stone, Atlantic Refining Company, 260 S. Broad Street, Philadelphia 1, Pa.
B. G. Symon, Shell Oil Company, Inc., 50 West 50th, New York 20, N. Y.

The National Lubricating Grease Institute assumes no responsibility for the statements and opinions advanced by contributors to its publications. Views expressed in the editorials are those of the editors and do not necessarily represent the official position of the N L G I. Copyright 1953, The N L G I.

IN THIS ISSUE

Page

PRESIDENT'S PAGE 6
by W. Wayne Albright, Standard Oil Company (Indiana)

ABOUT THE COVER 7

A LABORATORY FIVE-POUND GREASE KETTLE..... 8
by E. L. Armstrong, Socony-Vacuum Laboratories

NLGI 21st ANNUAL MEETING 14

NLGI TECHNICAL COMMITTEE MEETING..... 24

PATENTS AND DEVELOPMENTS 29

NLGI WINS TOP JOURNALISM AWARD 32

BENNETT INDUSTRIES, INC. JOINS.....34

"LUBRICATE FOR SAFETY EVERY 1,000 MILES".....37

PEOPLE IN THE INDUSTRY.....41

INDUSTRY NEWS 44

FUTURE MEETINGS OF THE INDUSTRY.....47

ABOUT THE COVER

This month's cover illustration is an aerial view of the world's largest lithium chemical plant, recently constructed and placed into operation at Sunbright, Va., by the Foote Mineral Company. Many of our readers will recall the illustration on the cover of the October 1952 issue which showed a scale model of this now completed plant. It seems fitting that those concerned with the use of lithium compounds should be able to follow through from the conception to the completion of this plant of which its major product, lithium hydroxide, is of such great importance to the manufacture of multi-purpose lubricants.

Figure 1—Kettle in operation

A Laboratory Five-Pound Grease Kettle

By E. L. Armstrong
Socony-Vacuum Laboratories

IN LABORATORIES engaged in grease research or technical service to grease and compounding plants, there is frequent need for small scale grease making equipment. The size of the equipment and of the batches should be as small as possible, but the results should correlate with full-scale grease-making.

Our laboratories have designed and constructed a five-pound grease kettle which is convenient and economical. Its construction and operation are described below, along with several typical problems which it has helped to solve.

Construction

The compactness of the kettle assembly is shown by Figures 1 and 2. Figure 1 is a photograph of a kettle in operation, and Figure 2 shows a bank of three kettles in a hood. In the unit at the left the kettle and heating mantle have been removed, and the paddle and sweep blades are visible.

Figures 3 and 4 are respectively front and side elevations of the kettle assembly. Parts are numbered to correspond to the following description.

The five-pound open-pot grease kettle (1) is suspended from a plate (2) and supported by tripod legs (3). The rigid spindle frame (4), anchored to the front leg extensions and gussets (5), carries all the bearing sleeves (6), the sprocket and miter spindle (7), the miter spindle (8, 9), and the miter gears (10). The miter spindles drive the paddle blades spindle (11) and the sweep blades sleeve (12) through gear sets 13 and 14 respectively.

The mechanism is driven by a 1/3 hp. electric gearhead motor (15), rated at 1725 rpm and 30-to-1 gear ratio, through a sprocket (16) and chain (17). The heating mantle (18) fits snugly over the grease kettle and is supported by the platform table (19). This table swings out from under the mantle to allow mantle and kettle to be removed.

Grease temperature is measured by a thermocouple (20), which is connected to the recorder shown at the right of the kettles in Figure 2. Grease temperature is controlled by a Variac in series with the heating element

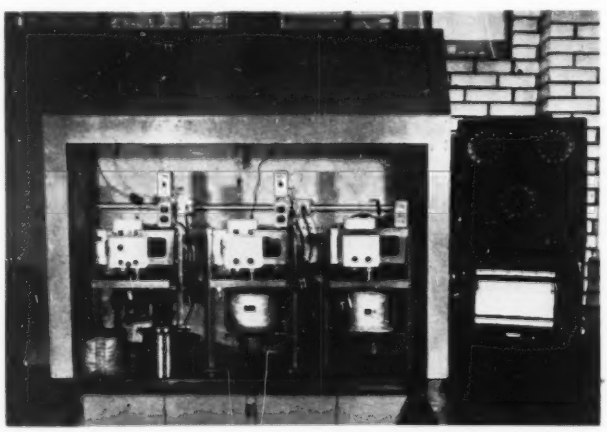


Figure 2—Bank of three kettles in a hood

in the mantle. The grease is kept from adhering to the sides of the kettle by scrapers (28), attached to the outside sweep frame. The sweep assembly is supported through the central spindle thrust collar (29). The grease kettle is held in place by studs and wing nuts (30).

The outside sweep blades (21, 23, 25, 27) are welded at their outer ends to the vertical sides of the sweep frame. They revolve at sprocket speed, or about 56 rpm under load. Each pair of inside paddle blades (22, 24, 26) is welded to its respective center ring. The rings are locked with set screws to the central paddle spindle. They revolve at twice the speed of the outside sweep blades, or about 112 rpm.

It is important that the components of the mix be worked thoroughly into a smooth, homogeneous mass, and at the same time be prevented from working over the top of the kettle. The arrangement of mixing blades shown below was developed by experiment to satisfy both these requirements.

Blades Are Numbered from Top Down

Blade Pair No.	*Blade Group*	*Paddle Action*	*Rotation Looking into Kettle*	*Paddle RPM*
21	Sweep	Down	Counterclockwise	56
22	Paddle	Down	Clockwise	112
24	Paddle	Down	Clockwise	112
26	Paddle	Down	Clockwise	112
23	Sweep	Up	Counterclockwise	56
25	Sweep	Up	Counterclockwise	56
27	Sweep	Up	Counterclockwise	56

FIGURE 3

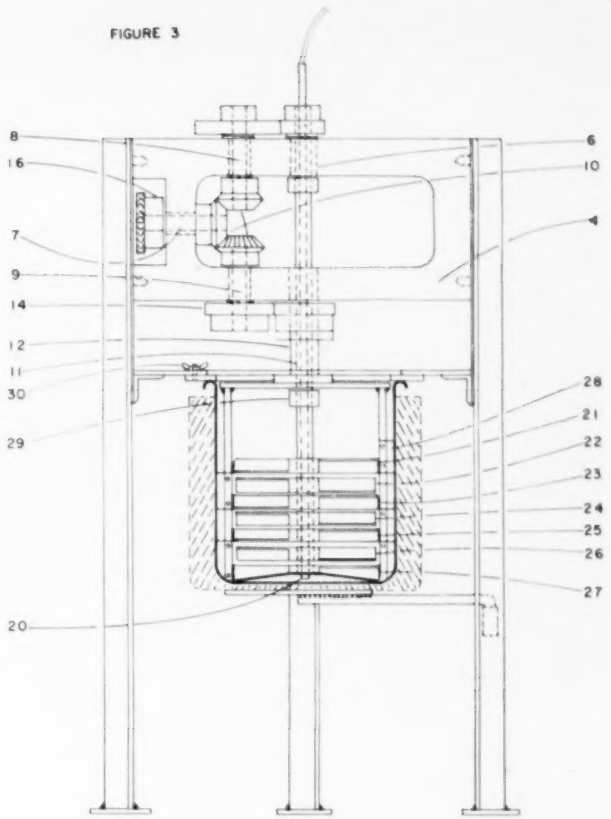
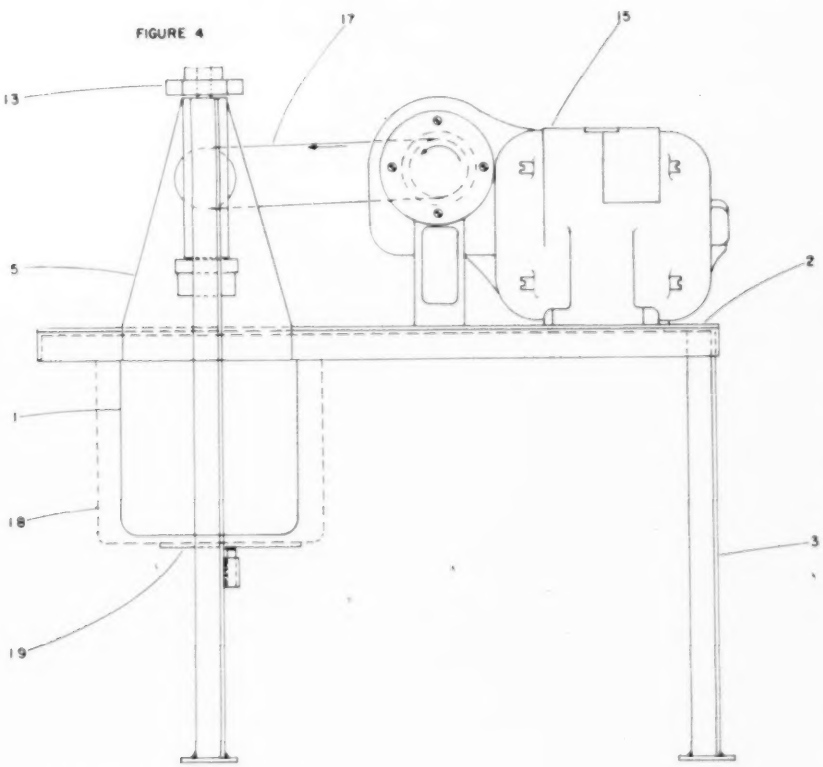


FIGURE 4



1. Open-Pot Grease Kettle
2. Plate
3. Tripod Legs
4. Rigid Spindle Frame
5. Front Leg Extensions and Gussets
6. Bearing Sleeves
7. Sprocket and Miter Spindle
8. Miter Spindle
9. Miter Spindle
10. Miter Gears
11. Paddle Blades Spindle
12. Sweep Blades Sleeve
13. Gear Sets
14. Gear Sets
15. 1/3 hp. Electric Gearhead Motor
16. Sprocket
17. Chain
18. Heating Mantle
19. Platform Table
20. Thermocouple
21. Outside Sweep Blade
22. Inside Paddle Blade
23. Outside Sweep Blade
24. Inside Paddle Blade
25. Outside Sweep Blade
26. Inside Paddle Blade
27. Outside Sweep Blade
28. Scrapers
29. Central Spindle Thrust Collar
30. Studs and Wing Nuts

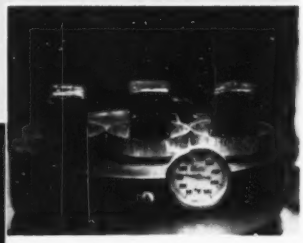
BENTONE* GREASES WON'T MELT

THE picture story shown below demonstrates why multi-purpose Bentone* greases have proved superior to conventional greases in high temperature service. A grease compounded with Bentone 34, a non-soap high-efficiency gelling agent, was heated between two ordinary soap base greases. While the gel structure of the two soap greases broke down as the temperature increased, the thermal stability of the Bentone grease can be seen at even 500°

Although the temperature at which Bentone greases will ignite is set by the fire point of the oil (as in the case of conventional greases), Bentone 34 greases, when properly compounded *will not melt*, even while burning.

Write today for your free copy of the new Bentone 34 brochure, filled with complete information about the many advantages of this non-soap gelling agent.

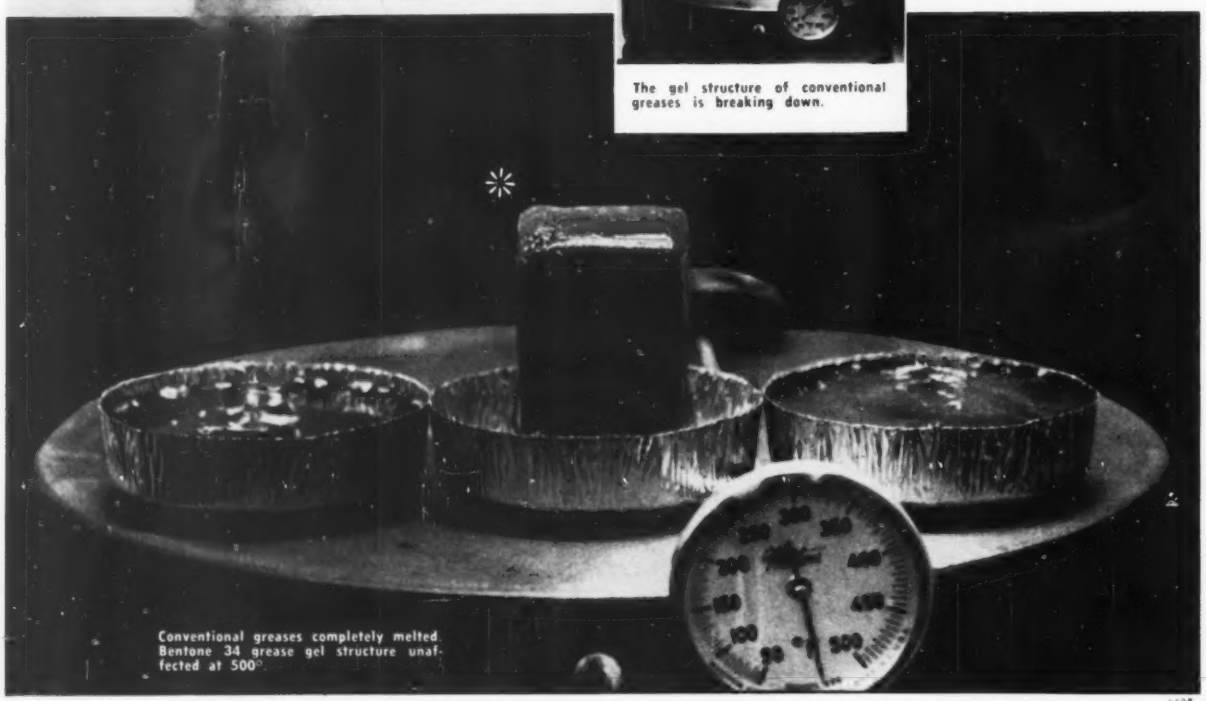
* TRADE MARKS REGISTERED U. S. PATENT OFFICE



Bentone 34 grease, center, between two conventional soap base greases.

The gel structure of conventional greases is breaking down.

NATIONAL LEAD COMPANY • BAROID SALES DIVISION
P. O. Box 1675 Houston 1, Texas



Conventional greases completely melted. Bentone 34 grease gel structure unaffected at 500°.

4495

Figure 5 is a close-up of the blades, with the heating mantle and kettle removed. It shows the inclination of the inside paddle blades and outside sweep blades.

Precautions

Due to the small mass in the kettle, extremely heavy soap bases "ride up" the wall during dehydration. This can be minimized by reducing the paddle speed and the amount of material charged to the kettle. However, it may be necessary to stop the paddles occasionally and scrape down the kettle with a spatula.

The heating and cooling periods in the small kettles must be slowed down so that the time-temperature cycle agrees closely with plant-scale batch operation.

Aeration problems are magnified in the small kettle. Use of a laboratory vacuum deaerator pot is recommended when they become troublesome.

Uses of the Five-Pound Kettles

Most of our work with these kettles has been carried out with sodium, calcium, and lithium soap greases. The following are typical of the problems which have been studied successfully.

1. Comparison of various types and viscosities of mineral oil in a standard lithium soap formula.
2. Investigation of the effects of different types and amounts of unsaturated fatty acids on calcium and sodium base greases.
3. Preliminary screening of new fatty acids, oxidation inhibitors, and other additives in standard commercial formulae. In most cases, only research quantities of these new materials are available.

In general, results from the five-pound kettle have been satisfactory. Greases made in it are not exactly the same as corresponding greases made in plant kettles, but they are close enough for screening purposes. The small kettle can justify broad decisions on grease quality. If finer distinctions are needed, tests can be carried out in pilot plant or full-scale equipment; in this case, the range of formulations to be tested can be narrowed considerably by use of the five-pound kettle first.

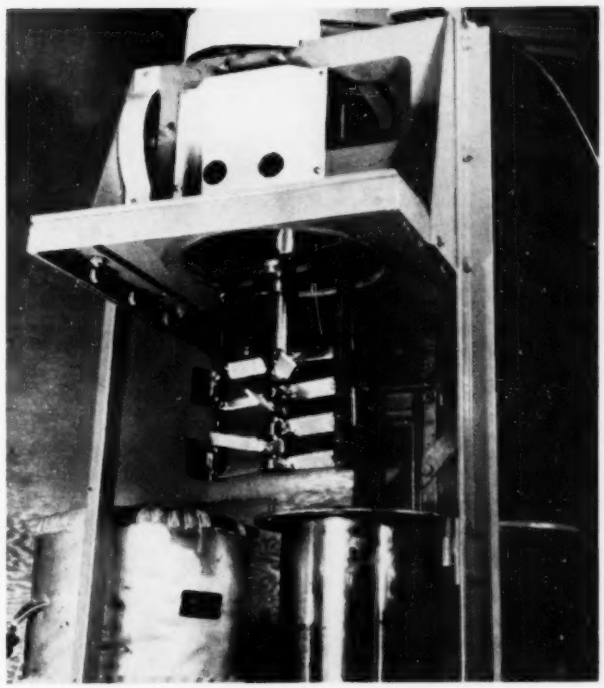


Figure 5—Close-up of the blades

Acknowledgment

The author is grateful to J. B. Kirkpatrick for the engineered design of the equipment. Thanks are also expressed to C. E. Randall, S. P. Marley and O. J. Black for their assistance in building the equipment and preparing this article.

NEVER UNDERESTIMATE THE IMPORTANCE OF LUBRICATION!

mbi

ON GUARD SINCE 1888

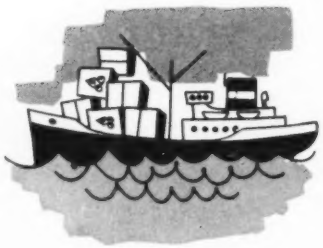
Yes-

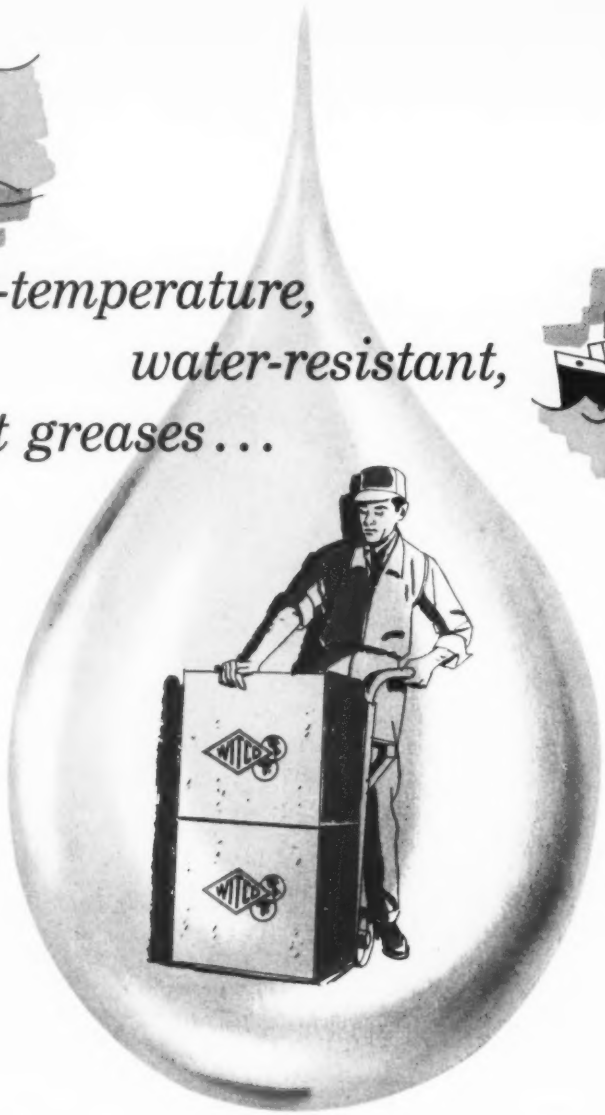
POWER, PERFORMANCE, PROFIT
for American Industry
in using mbi lubricants!

MAGIE BROS., Incorporated

1640 CARROLL AVENUE, CHICAGO 12, ILLINOIS, PHONE HAYmarket 1-0404

For high-temperature,
water-resistant,
transparent greases...





WITCO LITHIUM STEARATE

Witco products for the grease industry:

Aluminum Stearates
(medium, high and very high gel)
Lead Naphthenate
Lead Oleate
Lead Stearate
Lithium Hydroxystearate
Sodium Stearate

Carefully preformed, for standardized properties. High gel gives you high yield, greater economy in production. In a wide variety of oils, six to fifteen per cent soap provides outstanding properties for multi-purpose greases. Special grades available for lower cooking temperatures.

Write today for complete information. Samples available upon request.

WITCO CHEMICAL COMPANY

260 Madison Avenue, New York 16, N. Y.
Los Angeles • Boston • Chicago • Houston • Cleveland
San Francisco • Akron • London and Manchester, England

Gives white hot steel the "kid glove" treatment

GIGANTIC MACHINES with thousands of moving parts are used to shape white hot ingots into plates and sheets. All of these hard-working machine parts are subject to intense heat . . . normal in steel manufacturing. Because of the intense heat, lubrication is a serious problem.

U. S. Steel has tried various types of greases in order to eliminate the problem of oil burn-out. Now they're using a product of Shell Research, Shell Alvania Grease. Result: better lubricating action *at once*. Months after the original installations, rollers were removed and an excellent film of grease was still present.

At the other extreme, zero weather caused grease in an automatic lubricating system to congeal and become unpumpable. Shell Alvania was tried and clogging promptly stopped. This multi-purpose grease is now used extensively in low-temperature operations at U. S. Steel's Ohio Plant.

SHELL ALVANIA GREASE

- **resists oxidation**
- **will not squeeze out**
- **extends periods between overhauls**
- **provides exceptional lubrication in high or low operating temperatures.**

Shell Alvania Grease can cut down costly maintenance and save time and money in *your* plant. Write for technical information.

SHELL OIL COMPANY

50 WEST 50TH STREET
NEW YORK 20, NEW YORK

100 BUSH STREET
SAN FRANCISCO 6, CALIFORNIA

SHELL

NAT[illegible] GREASE INSTITUTE

21st annual meeting

OCTOBER 26 • 27 • 28 • 1953

EDGEWATER BEACH HOTEL • CHICAGO, ILLINOIS

OIL AFFECTS EVERYTHING

Ole Berg, Jr., The British American Oil Company Limited

Ole Berg, Jr.

Ole Berg, Jr., president and a director of The British American Oil Company Limited, Toronto, Canada, is a native of San Francisco, Calif. He received his education at Oakland, Calif., and has had a varied and extensive experience in the oil industry dating back to 1921.

In his 27 years with the Union Oil Company, Mr. Berg rose from office clerk to manager of marketing. In 1945, Mr. Berg was appointed vice-president and manager of general sales of the Union Oil Company of California. He was also vice-president and a director of the Union Oil Company of Canada.

Mr. Berg joined British American Oil in 1948 as vice-president and assistant to the president. Later he became vice-president of marketing and in August 1951, he was elected president.

Mr. Berg belongs to American Petroleum Institute; The Granite Club, Toronto; York Downs Golf Club, Toronto; Jonathon Club, Los Angeles; York Club, Toronto; and Toronto Club, Toronto. He is past president of the Portland, Ore., Kiwanis Club.

Mr. Berg is a director of The Bank of Nova Scotia.

Abstract

The most noticeable trend in the world oil picture is the decentralization of the industry. Production has spread to new areas of the globe; processing of crude is done thousands of miles away from the source; and the amazing industrial evolution which many countries of the world are experiencing in varying degree has made the petroleum market a truly international one.

The U. S. alarmists of twenty years ago who prophesied a petroleum shortage in two decades (even at the rate of consumption in those days) have been incorrect. World oil production so far this year is the highest on record and shows sharp increases over last year. The markets grow larger year after year.

Symbolic of this changing pattern of the world oil picture is the development of the Canadian petroleum industry. As recently as 1947 Canada was eighteenth on the list of world oil producers, importing 90% of her requirements. Today, six years and one billion dollars of development-investment later, she ranks eighth among oil producers.

Canada's current daily requirements have shot to 500,000 b/d and domestic production is meeting 45% of these requirements. Nearly a million dollars is being spent daily on exploration and production to bring in a gas or oil discovery well at the rate of one every third day.

With the Trans Mountain Pipe Line going into operation, pipelines will be moving prairie petroleum west as well as east. Canada's refining capacity now stands at ½ million b/d, and will increase substantially when current expansion of existing refineries is completed.

Canada's record is a fair reflection of how world oil is expanding. In the Middle East, despite the loss of Iran's production, the first half of 1953 saw 2.3 million b/d being produced—an all-time record. Other refineries have been able to step up production to meet the demand created by the shut-down of the Anglo-Iranian refinery at Abadan, the main supplier of refined products in the Middle and Far East.

Europe, the second largest consumer area for petroleum products in the world, has successfully undertaken a major expansion of her refining capacities. In six years these have increased five times, including several plants going into operation this year.

The free world is producing at the rate of 11.6 million b/d compared with the estimated 1.2 million b/d produced by Russia and her satellites. This ten-fold lead over the Soviets should be qualified by the fact that Communist production is almost exclusively for the government and the military.

A growing demand for Western Hemisphere petroleum products (e.g., for increased automobile registrations, tractors, petrochemical uses) with a corresponding expansion of the production necessary to meet it, can be reason-

William H. Garbade

J. C. Kirk

E. W. Nelson

Eric O. Forster

J. J. Kolfenbach

ably forecast. And this is true regardless of atomic developments within the foreseeable future.

The world will continue to require more and more energy, and even the most liberal predictions do not allot more than 10% of the world's power needs to atomic energy within the next 20 years.

At the very core of our industrial democracy, the oil industry is responding to an era of greater activity and dimensions than ever before, because oil affects everything and everything affects oil.

YOUR OBLIGATION TO MARKETING

William H. Garbade, Deep Rock Oil Corporation

William H. Garbade, president of Deep Rock Oil Corporation, has a wide background in the field of petroleum marketing.

As Deep Rock's president, he has guided that company through five years of the development of its unique marketing program for independent jobbers, the Deep Rock Plan. In addition, since joining the company in 1948, he has directed the modernization and expansion of Deep Rock's refinery, the intensification of its oil finding program, and a general staff reorganization.

Mr. Garbade's marketing background extends back to his 15 years with Shell Oil Company where he was assistant treasurer before accepting his present position. His important marketing assignments with that concern included field sales managership. Some of the studies he initiated helped Shell modernize its marketing program and reduce distribution costs. After World War II, he participated in the reorganization of Shell's distribution in Western Europe.

His work at Shell was unusually diversified. In addition to marketing, it included advertising, accounting, supplies, economics and transportation.

A native of New York, he studied at Colgate University, then transferred to New York University to obtain his B.S. degree in 1932 and his M.B.A. in 1935. While studying on his master's, he started working for Shell part time.

Mr. Garbade is a director of the Independent Petroleum Association of America and the American Petroleum Institute, and a member of several Tulsa business, civic and social clubs. A family man, he and Mrs. Garbade maintain a home in Tulsa with a daughter and son.

OXIDIZED PETROLEUM WAX AS A GREASE BASE

J. C. Kirk, Continental Oil Company

Co-Author: E. W. Nelson, Continental Oil Company

James C. Kirk was reared in central Texas and graduated from Baylor University with a B.S. in chemistry in 1944. After working 18 months in the analytical laboratories of Pan American Refining Corporation, he started graduate studies at Ohio State and received his Ph.D. with a major in organic chemistry in 1949. His thesis work was a study of the mechanism of the Schmidt reaction. Since 1949 Dr. Kirk has been associated with Continental Oil Company and at present is acting group leader of the petrochemical research section.

E. W. Nelson is a native Kansan who has spent his entire career in the Midwest. Born at Hutchinson, Kans., he received his B.S. degree from Bethany College and thereafter was engaged as a teacher of high school chemistry and physics. His graduate work was done at the University of Minnesota where he received an M.S. degree in chemical engineering. His first introduction into industry was with the Cook Paint and Varnish Company of Kansas City where the next two years were spent.

For more than 25 years he has been employed by the Continental Oil Company, most of which time has been spent in development and research in the field of lubricants, particularly lubricating greases and cutting oils. Since its formation he has been a member of Continental's development and research department where he is in charge of grease development.

Abstract

Until recently violent fluctuation in the price of natural fats has made petroleum derived fatty acids desirable as a grease base. For some applications

greases from oxidized wax have been found to be comparable to greases from normal fats. The mechanism of wax oxidation and some of the reaction variables are discussed. Several oxidation catalysts were investigated and a mixture of very finely divided manganese dioxide and zinc stearate was found to be particularly effective. Sodium, lithium, calcium, and mixed sodium-calcium greases were prepared. Results of fleet tests with a lithium grease are discussed.

THE EVALUATION OF WHEEL BEARING GREASE PERFORMANCE

Eric O. Forster, Standard Oil Development Company
Co-Author: J. J. Kolfenbach, Standard Oil Development Company

Eric O. Forster received his B.S. and Ph.D. in physical chemistry from Columbia University in 1949 and 1951, respectively. After his graduation, he joined the Esso Laboratories of the Standard Oil Development Company where he is a research chemist in the industrial lubricants section. He is a member of the A.C.S. and Sigma Xi.

J. J. Kolfenbach obtained the B.A. degree from Loras College in 1939, and his Ph.D. in biophysical chemistry from Iowa State College in 1944. He has been associated with the Esso Laboratories since 1944. He is a group leader in the industrial lubricants section. He is a member of A.C.S., Sigma Xi, and S.A.E.

Abstract

Four wheel bearing greases were evaluated in extensive field tests employing 35 units which accumulated one and a quarter million test miles. Results are compared with laboratory evaluation. It appears that the commonly performed laboratory tests permit at best only a screening of the greases, and the final answer to field performance must be obtained in field tests using various types of equipment under various driving conditions.

A scheme for effective field testing of wheel bearing greases is discussed, and suggestions are put forward for improved servicing of wheel bearings.

Electron micrograph evidence indicates that field performance causes structural changes in greases which cannot be simulated by presently accepted laboratory tests.

The problem of fretting corrosion is briefly reviewed, together with wear problems as observed in wheel bearings. The need for a more detailed knowledge of metallurgy appears necessary before these problems can be solved.

TO MIX OR NOT TO MIX—A STUDY OF WHEELBEARING GREASE COMPATIBILITIES

Melville Ehrlich, American Lubricants, Inc.
Co-Author: Francis S. Sayles, American Lubricants, Inc.

Melville Ehrlich received his S.B. and S.M. degrees in chemistry from the Massachusetts Institute of Technology in 1933 and 1934 respectively. He worked four years as a research chemist for National Aniline & Chemical Co., Buffalo. Mr. Ehrlich taught science at Seneca Vocational High School at Buffalo four years. He has been with American Lubricants, Inc., since 1942. Mr. Ehrlich is research director.

Mr. Ehrlich is active in A.C.S., A.S.T.M., S.A.E., A.S.L.E., NLGI and O.I.I.C.

In 1943, Francis S. Sayles received his B.S. in chemistry from Canisius College. He received his M.S. in chemistry from the same college in 1947. Mr. Sayles has been with American Lubricants, Inc., since 1943 as a control and research chemist except for the two years between 1944 and 1946, which were spent in the Navy. He was discharged as a lieutenant.

Abstract

Wheelbearing greases or multipurpose greases recommended in part for wheel bearing lubrication, have been mixed, then the mixtures and their components tested on the ASTM tester D-1263-53T. In general, the "performability" of a mixture is not as good as is that of the original wheelbearing lubricant. However, the degree to which any one grease is affected by the admixture of a second grease varies widely. Some of the factors are here developed.

Melville Ehrlich

Francis S. Sayles

Mrs. Valeria Elersich

Dr. Marjorie J. Vold

Richard F. Baker

Robert D. Vold

GREASE STRUCTURES INDICATED BY X-RAY ORIENTATION ANALYSIS AND ELECTRON MICROSCOPY (Progress Report on Research Conducted Under NLGI Fellowship Program*)

Mrs. Valeria Elersich,† University of Southern California

Co-Authors: Drs. Marjorie J. Vold, Richard F. Baker and Robert D. Vold, University of Southern California

Ten years with The Standard Oil Company (Ohio) intensified Mrs. Valeria Elersich's interest in scientific research to the extent that she is now back in college earning her Ph.D. degree. She received her B.A. degree in chemistry at Western Reserve University in 1943. In June of this year she resumed graduate studies at the University of Southern California, where she will work in the field of colloid chemistry under the direction of Dr. Robert D. Vold. At the time she left Standard Oil, Mrs. Elersich was supervisor of the Patent and Information Group for the Research Division. She is a member of the American Chemical Society, Sigma Xi, and Special Libraries Association.

Dr. M. J. Vold was born in Canada (1913) but grew up in California, attending the University of California at Berkeley from 1930 to 1936. She received her B.S. in chemistry in 1934 and was awarded the University Medal as class valedictorian. Her Ph.D. work was in the field of reaction kinetics and was carried out under the direction of Dr. Axel R. Olson.

Dr. Robert D. Vold and Mrs. Vold have collaborated in their studies of the physical and colloidal chemistry of soap systems since 1937, first at Stanford in collaboration with Professor J. W. McBain and subsequently at the University of Southern California. Between them they have published over sixty papers dealing with various aspects of this topic including phase studies in oil and water systems, polymorphic transitions in solvent-free soaps, soap hydrates, differential thermal analysis, properties of soap solutions, structural studies by x-ray diffraction and electron microscopy, etc. Mrs. Vold gained some insight into the problems of the petroleum industry through a three-year period of employment in the research laboratories of the Union Oil Company (1943-46). She held the NLGI fellowship during the academic year 1951-52.

It is not all work and no play with the Volds. Their major hobbies include three young children, high mountain vacations, photography and gardening.

Richard F. Baker, a native of Westfield, Pennsylvania, received his B.S. and M.S. degrees from Pennsylvania State College. A Ph.D. in Physics was earned at the University of Rochester in 1938. Dr. Baker held the position of biophysicist at Columbia and John Hopkins from 1938 to 1941. Following this he became physicist for RCA laboratories until 1947. He then accepted his present position as associate professor of experimental medicine at the University of Southern California. His chief interests are electron optics and the application of the electron microscope to morphological problems in biology and chemistry.

Dr. Robert D. Vold obtained his B.A. and M.S. degrees from the University of Nebraska and Ph.D. from the University of California at Berkeley where he studied with Professor Hildebrand. After two years as a research chemist with the Procter and Gamble Company in Cincinnati, Ohio, Dr. Vold spent four years at Stanford University as a post-doctoral fellow where he was associated with Professor McBain. He came to the University of Southern California as an assistant professor in 1941 and is now professor of chemistry, currently on sabbatical leave at the University of Utrecht as a Fulbright research scholar.

Dr. Vold is the author of over fifty research papers in the general field of colloid chemistry. These fall largely into four different groups: Studies of crystalline and liquid crystalline phases by x-ray diffraction, differential calorimetry, microscopy, rheology, etc.; peptization, suspending power, emulsification, solubilization and ion-exchange in systems of solids or liquids in colloidal dispersion; properties of surface films on solids; structure of gels.

*This work was also supported in part by the Office of Ordnance Research, Contract No. DA-04-495-Ord-303.

†National Lubricating Grease Institute Fellow.

grease manufacturers

FOR
RESISTANCE TO OXIDATION
CONTROLLED END PRODUCT
LIGHT COLOR
UNIFORMITY

INSIST ON A. GROSS FATTY ACIDS

GROCO 58—HYDROGENATED TALLOW FATTY ACIDS

Titre	57.0°C. min.
Titre	134.6°F. min.
Color Lovibond 5¼" Red	1.0—2.0
Color Lovibond 5¼" Yellow	5—15
Unsaponifiable	0.25%—0.75%
Saponification Value	202-204
Acid Value	201—203
Iodine Value (WIJS)	3 max.

Write for our free booklet "Fatty Acids In Modern Industry."

A. GROSS & Company

295 Madison Ave.
New York 17, N. Y.
Factory, Newark, New Jersey
Distributors in principal cities
Manufacturers since 1837

E. G. Jackson

E. R. Booser

Robert E. Fariss

Abstract

Evidence has been obtained that the extent of formation and the rigidity of secondary structure in greases, arising from the cohesion of soap particles on contact or from crystalline intergrowth, varies widely from grease to grease. Part of the evidence is based on direct observation in the electron microscope of structures present in thin slices (0.1μ) obtained from greases in which oil had been replaced by cetane. Further evidence is obtained from the distribution of particle orientations after flow, measured by the variation in intensity of lines in the x-ray diffraction patterns with angle of incidence of the x-ray beam on the grease specimen.

The two techniques agree in suggesting the absence of coherent interparticle structure in aluminum greases of sufficient coarseness to be resolvable. For calcium greases, the electron micrographs show appreciable structure but the x-ray work shows that the soap particles are almost but not quite as free to orient as would be expected for dispersions of separate particles. Sodium greases show a considerable degree of structure with the electron microscope, and a resistance to orientation which persists even in the extracted soap. Lithium greases are highly individual, but one sample gave results which may be interpreted to mean that the structure is sufficiently rigid to break into fragments when the grease is sheared rather than deforming or dissociating into ultimate particles. A complex barium grease, studied only with the electron microscope, showed separate crystals of low molecular weight components together with fiber bundles which apparently grow without angular branching to tremendous lengths and are apparently also quite flexible. These generalizations, of course, extend only to the group of samples so far studied.

This approach appears to permit a more systematic and definitive analysis of the relative roles played by particle geometry and particle interaction in influencing grease properties than has hitherto been possible.

GREASES FOR ELECTRIC MOTORS

E. G. Jackson, General Electric Company

Co-Author: E. R. Booser, General Electric Company

Earl G. Jackson received a B.S. degree from American International College and an M.A. degree from Clark University before going into the Navy in 1943. From 1946 to 1948 he worked for Merck and Company in its physical chemical research laboratory. In 1951 he received a Ph.D. from Rutgers University where he worked on the physical chemistry of polymeric soaps. Since then he has worked at the Bearing and Lubricant Center on physical chemical problems of bearing materials and lubrication. He is a member of A.C.S., A.A.A.S., N. Y. Academy of Sciences and Sigma Xi.

E. Richard Booser received a Ph.D. degree from The Pennsylvania State College in 1949 following graduate studies in petroleum refining. Since that time he has been engaged in work on various phases of lubrication at the Bearing and Lubricant Center of the Thomson Laboratory. He is chairman of the Lubrication Fundamentals Committee of the A.S.L.E. and a member of the A.C.S. and A.I.Ch.E.

Abstract

Although a number of excellent greases are now available for electric motor lubrication, the industry is always looking for something better. This improvement may be either longer life, perhaps literally permanent lubrication, or satisfactory service over the extended temperature ranges called for both by the military and by the trend toward greater power in smaller packages.

Enough experience and test data have been accumulated so that we may approach the problem of designing the necessary properties into these improved greases. Values can be approximately assigned for bleeding rate, evaporation, and torque, which in turn depend on oil viscosity, soap type and soap concentration. Variations in the grease required by different types of bearings are recognized and can be specified. Some desirable properties are apparent, but improvement depends on further developments in rust inhibitors, oxidation resistance, etc.

Properties which might provide an ideal grease for electric motors are proposed as a goal to work for.

SOME ASPECTS OF THE PREPARATION OF BENTONE* GREASES

Robert E. Fariss, Baroid Sales Division, National Lead Company

Robert E. Fariss received a B.S. in chemical engineering from Rice Institute in 1942 and was employed as a research chemical engineer by the Dow Chemical Company from 1942 to 1944. In 1944 he entered the Naval Reserve and served as navigator and communications officer aboard one of the auxiliaries. On release to inactive duty in 1946, he re-entered Rice Institute and was awarded a Ph.D. degree in 1950.

After a brief period with the production research department of the Texas Company, Mr. Fariss joined the Baroid Sales Division of National Lead Company in April 1951. He is employed as a section leader in the research and development laboratories and assigned to development work on Bentone greases.

Mr. Fariss is a member of Sigma Xi, Phi Lambda Upsilon, A.I.Ch.E. and S.A.E.

Abstract

With the continual increase in the number of Bentone grease compounders and the greatly expanded application of Bentone greases a wide variety of variables in production methods, oil stocks and extraneous additives has entered the picture. Several production methods are discussed and their relative efficiencies correlated. The influence of variations in oil stocks and the use of additives with these systems are taken up. Mechanical working is treated briefly. It is shown how maximum benefit can be obtained from Bentone 34 by the proper selection and use of dispersing aids.

**Bentone is the registered trademark of the National Lead Company.*

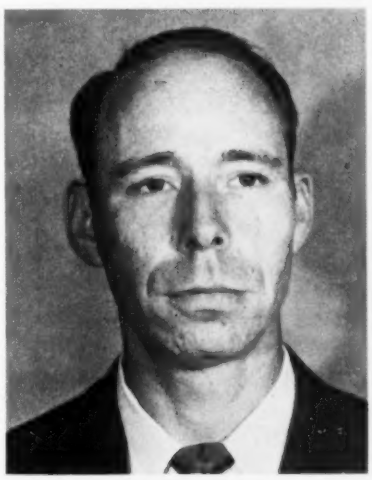
Edward A. Swakon

SUBSTITUTED UREAS AS GREASE THICKENERS*

Edward A. Swakon, Standard Oil Company (Indiana)
Co-Authors: C. G. Brannen and L. C. Brunstrum, Standard Oil Company (Indiana)

Edward A. Swakon served three years in the Navy and attended Williams College. He received his Sc.B. degree in chemistry from Brown University, and the degrees of M.S. and D.Sc. in organic chemistry from Carnegie Institute of Technology. Since 1951 he has been a member of the research department of the Standard Oil Company (Indiana). He is a member of the American Chemical Society, Phi Kappa Phi, and Sigma Xi.

Cecil G. Brannen received the B.S.A. and M.S. degrees at the University of Arkansas in 1940 and 1941. Following four years of service in the Army, he entered graduate school at Iowa State College and worked in the field of organosilicon chemistry. After receiving the Ph.D. degree, he joined the research department of the Standard Oil Company (Indiana) in Whiting. He is a member of the A.C.S., Alpha Chi Sigma, and Sigma Xi.



Cecil G. Brannen

L. C. Brunstrum has been a member of the research department of the Standard Oil Company (Indiana) since he received his B.S. in chemical engineering from Armour Institute of Technology in 1929. He is currently the section leader in charge of greases and industrial lubricants. He is a member of the A.C.S., Society of Rheology, and A.S.L.E.

Abstract

Recent strides have been made in fluid lubricants, such as silicones, fluorocarbons, polyglycols, and silicate esters, and in grease thickeners, such as soaps, silica aerogels, and copper phthalocyanines. However, no grease has been available that could be used from sub-zero temperatures to 450°F for lubricating ball bearings at high speeds.

Silicones and an organic thickener showed the best promise of meeting the requirements. The problem was to find an organic thickener having high melting point, chemical and thermal stability, compatibility with the oil, no harmful effect on the lubricant, and the desired particle size.

Aryl-substituted ureas were found to have the desired properties. Over fifty

**This work was done in partial fulfillment of a contract between Wright Air Development Center and Standard Oil Company (Indiana).*

L. C. Brunstrum

BENNETT'S H.E.F.

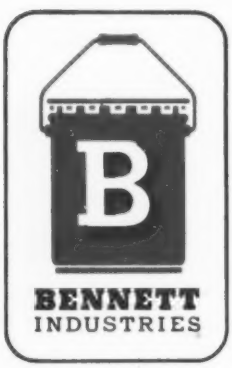
(Hidden EXPERIENCE Factor)

gives your grease added protection

See Harry LePan
Bob Ernst and
Don Maahs
at the Convention

•

CHICAGO TELEPHONE
INTEROCEAN 8-9480



Representatives in all large cities

(Style 8, Manufactured in 2½—6 gal. sizes)

Our number 8 style pail, shown at right, is the acknowledged leader of the steel pail industry in precision workmanship and customer satisfaction.

(Style 8)

(Style 9)

We supply a number of styles with and without spouts, lithographed in your colors and your individual label design. Mail coupon at right for full details.

Find out today how BENNETT can help you

BENNETT INDUSTRIES G
Peotone, Illinois

Please send me full details and prices on your complete line of steel pails.

NAME _____

STREET _____

CITY _____ STATE _____

were prepared. Greases compounded from these thickeners and silicone oil are noncorrosive, high melting, and thermally and chemically stable. They have good rheological properties. In laboratory tests, several have repeatedly performed for over 500 hours in ball bearings operating at 450°F. and 10,000 rpm.

THE PERFORMANCE AND TESTING OF LUBRICATING GREASES UNDER WET OPERATING CONDITIONS

J. D. Smith, International Lubricant Corporation

Co-Author: H. L. Hendricks, International Lubricant Corporation

J. D. Smith

J. D. Smith was born in Raleigh, Miss., October 10, 1916. After graduation from high school in Madison, Miss., June 1935, he attended Millsaps College, Jackson, Miss. There he received his B.S. degree with a major in chemistry in 1938. He received a graduate assistantship to Georgia Institute of Technology 1938-1940, graduating with an M.S. in organic chemistry in 1940.

Mr. Smith was employed by Joseph E. Seagrams Distillery from June to September 1940. He worked for the U. S. Food and Drug Administration from September 1940 to April 1941. He has been with International Lubricant Corporation since April 1941.

In November 1940, Mr. Smith received a direct Army ORC commission in the chemical corps. He went on active duty in June 1942 and for most of World War II he served in a production and engineering capacity at Pine Bluff Arsenal, Ark., in the manufacture and filling of poison gases. He returned to International Lubricant Corporation in February 1946 and assumed the duties of chief chemist—supervising both the company's control and research laboratories. He is currently active in the Army reserve program.

June 10, 1942, Mr. Smith married Thais Margaret Wild. They have two children, Eric, 9, and Cynthia, 4.

Mr. Smith belongs to A.S.T.M., A.C.S., American Institute of Chemists and Southern Association of Science and Industry. His hobbies are photography and gardening.

H. L. Hendricks

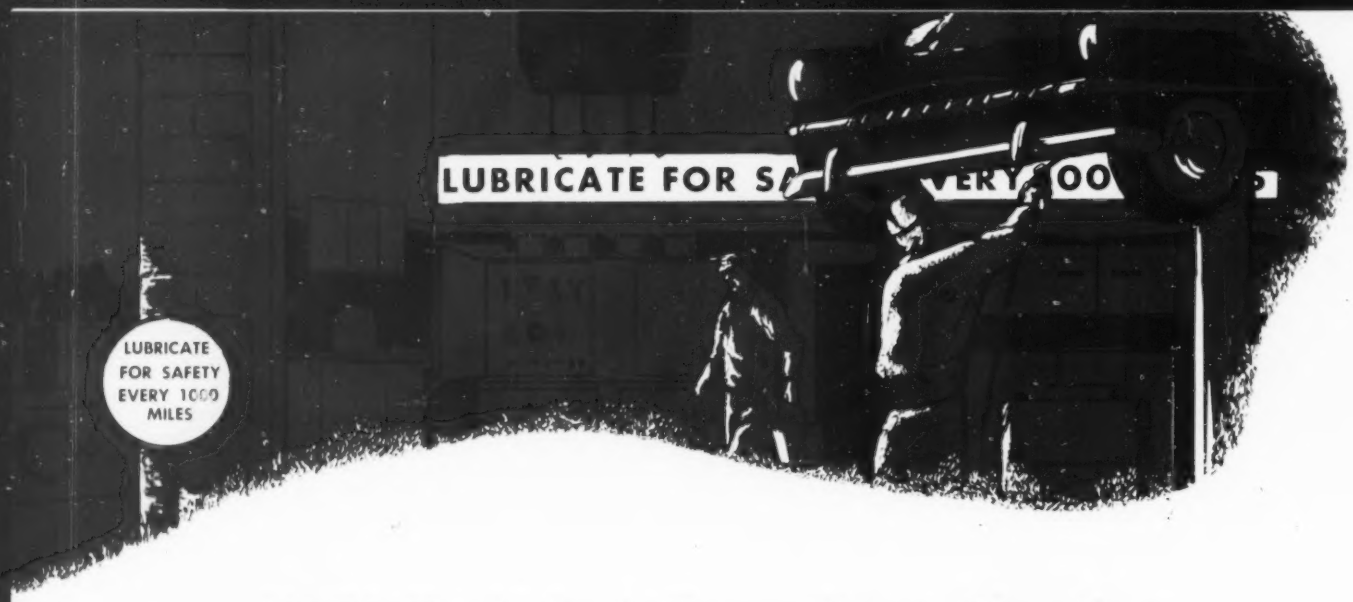
H. L. Hendricks was born in Devereaux, Ga., March 2, 1918. He attended public schools of North Carolina. He received his A.B. degree in chemistry from Elon College in 1939 and his B.Ch.E. degree from North Carolina State in 1940. Additional graduate work was done at the University of North Carolina and Washington University in chemical and mechanical engineering. Mr. Hendricks' engineering apprenticeship was done as a representative of North Carolina University at the National Bureau of Standards in Washington.

Mr. Hendricks was employed part time in 1941-1942 as a test chemist with North Carolina State Gasoline and Oil Inspection Laboratories. He started his career with Shell Oil Company as a research engineer in fuels and lubricants in 1942. In 1946 he was transferred to International Lubricant Corporation and is now group leader in grease research and evaluation.

Abstract

Much work has been done and reported in various technical journals on investigating the various performance characteristics of lubricating greases under a wide range of conditions. However, it appears that little has been reported on the performance of greases under wet operating conditions, and, among the test methods for predicting the behavior of greases under these conditions, few have been standardized or gained wide acceptance. Yet reports from the field have indicated this characteristic to be a most important one both from a lubricating point of view as well as corrosion prevention.

This paper discusses the problem, outlines the behavior of conventional greases containing various thickening agents, and describes the available test methods. Several suggested new test methods are presented as well as the use of modifying additives to achieve greases with better performance characteristics under wet operating conditions.



NLGI Technical Committee Meeting

October 28, 1953

I. REPORTS OF SUBCOMMITTEES—9:00 a.m.-10:30 a.m.

1. *NLGI Classification of Lubricating Greases*
H. C. Zweifel, Richfield Oil Corp.

2. *Procurement of Technical Papers for Publication in the NLGI Spokesman*.....C. J. Boner
Battenfeld Grease & Oil Corporation

3. *Editorial Review*.....J. B. Stucker
The Pure Oil Company

4. *Research Fellowship*.....L. W. McLennan
Union Oil Company of California

5. *Preparation of Movie on Lubricating Greases*
H. C. Meyer, Jr., Foote Mineral Company

6. *Manual of Test Methods and Definitions of Terms Peculiar to the Lubricating Grease Industry*
W. J. Ewbank, Cato Oil & Grease Co.

7. *Recommended Practices for Packing Automotive Front Wheel Bearings*.....H. L. Hemmingway
The Pure Oil Company

8. *Delivery Characteristics of Dispensing Equipment for Lubricating Greases*.....N. Marusov
Gulf Research & Development Co.

9. *AFBMA-NLGI Cooperative Committee on Grease Test Methods*.....T. G. Roehner
Socony-Vacuum Oil Company, Inc.

10. *Joint Committee on Lubricating Greases for Railroad Antifriction Journal Bearings*
T. G. Roehner, Socony-Vacuum Oil Company, Inc.

11. *New Business*

II. SYMPOSIUM ON DISPENSING LUBRICATING GREASES IN SERVICE STATIONS AND GARAGES—10:30 a.m.-12:30 p.m.

Chairman—J. F. Carter, The Aro Equipment Corporation

1. *Automobile Manufacturers' Viewpoint*
W. B. Rice, Chrysler Corporation

2. *Service Station Operators' and Garage Owners' Viewpoint*.....A. R. Boyer
Shell Oil Company

3. *Dispensing Equipment Manufacturers' Viewpoint*.....J. Reinsma
Stewart-Warner Corp.

4. *Grease Manufacturers' Viewpoint*..J. M. Stokely
California Research Corporation

5. *Method of Selecting Dispensing Equipment and Lubricating Greases*.....N. Marusov
Gulf Research & Development Co.

6. *Panel Discussion—Questions and Answers*

NLGI 21st Annual Meeting Program

MONDAY—OCTOBER 26

MORNING SESSION—10:00 a.m.—Chairman, G. A. Olsen

1. *Address of Welcome*—W. W. Albright, Pres.
2. *Oil Affects Everything*—Ole Berg, Jr., President, British American Oil Company, Ltd.

AFTERNOON SESSION—2:00 p.m.—Chairman, H. L. Hemmingway

3. *Greases for Electric Motors*—E. G. Jackson and E. R. Booser, General Electric Company
4. *Oxidized Petroleum Wax as a Grease Base*—J. C. Kirk and E. W. Nelson, Continental Oil Co.
5. *Substituted Ureas as Grease Thickeners*—E. A. Swakon, C. G. Brannen and L. C. Brunstrum, Standard Oil Company (Indiana)

4:15 p.m. ANNUAL BUSINESS MEETING

6:00 p.m. SOCIAL HOUR

7:00 p.m. ANNUAL DINNER

TUESDAY—OCTOBER 27

MORNING SESSION—9:30 a.m.—Chairman, G. A. Olsen

6. *To Mix or Not to Mix—a Study of Wheelbearing Grease Compatibilities*—Melville Ehrlich and F. S. Sayles, American Lubricants, Inc.
7. *Evaluation of Wheel Bearing Grease Performance*—E. O. Forster and J. J. Kolfenbach, Esso Laboratories, Standard Oil Development Co.
8. *Your Obligation to Marketing*—W. H. Garbade, President, Deep Rock Oil Corporation

AFTERNOON SESSION—2:00 p.m.—Chairman, W. W. Albright

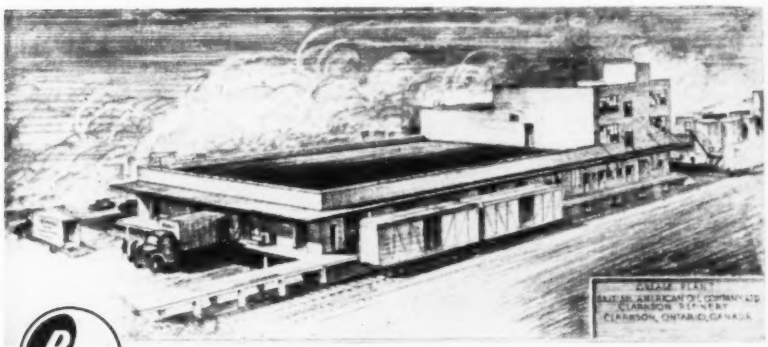
9. *The Performance and Testing of Lubricating Greases Under Wet Operating Conditions*—J. D. Smith and H. L. Hendricks, International Lubricant Corporation
10. *NLGI Fellowship Report—Grease Structures Indicated by X-Ray Orientation Analysis and Electron Microscopy*—Mrs. Valeria Elersich, Drs. Marjorie J. Vold, Richard Baker and Robert D. Vold, University of Southern California
11. *Some Aspects of Preparation of Bentone Greases*—Robert E. Fariss, National Lead Company

WEDNESDAY—OCTOBER 28

TECHNICAL COMMITTEE MEETING

9:00 a.m.-10:30 a.m.—*Reports of Subcommittees*—Presiding, Technical Committee Chairman T. G. Roehner, Socony Vacuum Laboratories

10:30 a.m.-12:30 p.m.—*Symposium on Dispensing Lubricating Greases in Service Stations and Garages*—Presiding, Chairman J. F. Carter, The Aro Equipment Corporation



CONTROL BOARD

FURNACE

WEIGH TANK AREA

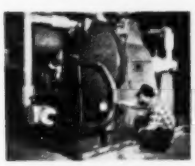
KETTLE MFG. AREA

. . . Inside and Outside

of British American Oil Company's New grease plant at Clarkson, Ontario.

Designed by the C. W. Nofsinger Company, this modern grease plant can produce more than 15 million pounds per year on a 250-day (eight-hour) basis!

We will welcome inquiries concerning your proposed projects.



DEAERATOR DEHYDRATOR

LABORATORY

PILOT PLANT

THE C. W. NOFSINGER COMPANY

Engineers and Contractors for the Petroleum and Chemical Industries

906 GRAND AVENUE KANSAS CITY 6, MISSOURI

NLGI Associate and Technical Mem

CONTAINER AND CLOSURE MANUFACTURERS

Bennett Industries, Inc.
Peotone, Illinois
Representative—S. A. Bennett

Central Can Company
2415 West 19th Street
Chicago 8, Illinois
Representative—Henry Frazin

Continental Can Company, Inc.
629 First National Bank Building
Omaha, Nebraska
Representative—T. A. Graham

Geuder, Paeschke & Frey Company
324 North Fifteenth Street
Milwaukee 1, Wisconsin
Representative—Neil Savee

Inland Steel Container Company
6532 South Menard Avenue
Chicago 38, Illinois
Representative—John H. Strome

J & L Steel Corp.
(Container Division)
405 Lexington Avenue
New York 17, New York
Representative—Jerry Lyons

National Steel Container Corp.
6700 South LeClaire Avenue
Chicago 38, Illinois
Representative—Henry Rudy

The Ohio Corrugating Company
917 Roanoke Ave. S. E.
Warren, Ohio
Representative—Lawrence F. McKay

Rheem Manufacturing Company
570 Lexington Avenue
New York 22, New York
Representative—F. J. Blume

Rieke Metal Products Corporation
Auburn, Indiana
Representative—Ralph S. Pearson

Trilla Cooperage, Inc.
2524 Blue Island Avenue
Chicago 8, Illinois
Representative—Lester Trilla

United States Steel Products
Division, United States Steel Company
30 Rockefeller Plaza
New York 20, New York
Representative—Wm. I. Hanrahan

Vulcan Stamping & Mfg. Co.
P. O. Box 367
Bellwood, Illinois
Representative—H. B. Scharbach

MANUFACTURERS OF EQUIPMENT FOR APPLICATION OF LUBRICATING GREASES

Aro Equipment Corporation
Bryan, Ohio
Representative—R. W. Morrison

Balcrank, Inc.
Disney near Marburg
Cincinnati 9, Ohio
Representative—Richard P. Field

Gray Company, Inc.
60 Northeast 11th Avenue
Minneapolis 13, Minnesota
Representative—B. A. Beaver

Lincoln Engineering Company
5701 Natural Bridge Avenue
St. Louis 20, Missouri
Representative—G. A. Hubbard

Stewart-Warner Corporation
Alemite Division
1826 Diversey Parkway
Chicago 14, Illinois
Representative—D. C. Peterson

United States Air Compressor Co.
5300 Harvard Avenue
Cleveland 5, Ohio
Representative—C. A. Bening

MARKETING ORGANIZATIONS

California Texas Oil Company, Ltd.
551 Fifth Avenue
New York 17, New York
Representative—Hal U. Fisher

Canadian Petrofina Limited
1015 Beaver Hall Hill
Montreal, Quebec, Canada
Representative—M. E. Wight

REFINERS

Farmers Union Central Exch., Inc.
P. O. Box G
St. Paul 1, Minnesota
Representative—H. F. Wagner

Mid-Continent Petroleum Corp.
Mid-Continent Building
P. O. Box 381
Tulsa, Oklahoma
Representative—J. W. Bascre

Valvoline Oil Company
Division of Ashland Oil and Refining Co.
Box G
Freedom, Pennsylvania
Representative—D. A. Smith

SUPPLIERS OF EQUIPMENT FOR MANUFACTURING LUBRICATING GREASES

Blaw-Knox Company
Buflovak Equipment Division
1543 Fillmore Avenue
Buffalo 11, New York
Representative—Edward V. Hegg

Chemicolloid Laboratories, Inc.
30 Church Street
New York 7, New York
Representative—David F. O'Keefe

The Girdler Corporation
224 East Broadway
Louisville 1, Kentucky
Representative—J. E. Slaughter, Jr.

Morehouse Industries
707 Henry Grady Building
Atlanta 3, Georgia
Representative—George E. Missbach

The C. W. Nofsinger Company
906 Grand Avenue
Kansas City 6, Missouri
Representative—C. W. Nofsinger

Stratford Engineering Corporation
1414 Dierks Building
Kansas City 6, Missouri
Representative—J. W. Sylvester

SUPPLIERS OF MATERIALS FOR MANUFACTURING LUBRICATING GREASES

American Cyanamid Company
30 Rockefeller Plaza
New York 20, New York
Representative—R. B. Wainright

Archer-Daniels-Midland Company
Chemical Products Division
2191 West 110th Street
Cleveland 2, Ohio
Representative—Frank C. Haas

Armour & Co., Chemical Division
1355 West 31st St.
Chicago 9, Illinois
Representative—H. F. Whitler

Attapulgus Minerals & Chemicals Corporation
210 West Washington Square
Philadelphia 5, Pennsylvania
Representative—R. H. Hubbell, Jr.

The Baker Castor Oil Company
120 Broadway
New York 5, New York
Representative—H. H. Fritts

Darling & Company
4201 South Ashland Avenue
Chicago 9, Illinois
Representative—G. W. Trainor

E. I. du Pont de Nemours & Co.
Wilmington, Delaware
Representative—John R. Sabina

Emery Industries, Inc.
4300 Carew Tower
Cincinnati 8, Ohio
Representative—R. F. Brown

Enjay Company, Inc.
15 West 51st Street
New York 19, New York
Representative—Sidney W. Fay

Foote Mineral Company
18 West Chelten Avenue
Philadelphia 44, Pennsylvania
Representative—James Fentress

General Mills, Inc.
Chemical Division
400 Second Avenue South
Minneapolis 1, Minnesota
Representative—Abner C. Hopkins, Jr.

A. Gross and Company
295 Madison Avenue
New York 17, New York
Representative—Eugene W. Adams

W. C. Hardesty Company, Inc.
P. O. Drawer 110
Dover, Ohio
Representative—W. G. McLeod

Harshaw Chemical Company
1945 East 97th Street
Cleveland 6, Ohio
Representative—W. J. Straka

Leffingwell Chemical Company
P. O. Box 191
Whittier, California
Representative—D. E. Murphy

...bers... *Supporting Your Organization These Suppliers Of Your Industry Hold Membership in NLGI*

Lithium Corporation of America, Inc.
Rand Tower
Minneapolis 2, Minnesota
Representative—Walter M. Fenton

The Lubrizol Corporation
Box 3057—Euclid Station
Cleveland 17, Ohio
Representative—John H. Baird

Mallinckrodt Chemical Works
2nd and Mallinckrodt Streets
St. Louis 7, Missouri
Representative—C. E. Cosby

N. I. Malmstrom & Company
147 Lombardy Street
Brooklyn 22, New York
Representative—Ivar Wm. Malmstrom

Marcus Ruth Jerome Company
327 South LaSalle Street
Chicago 4, Illinois
Representative—Harry Beinstein

Metasap Chemical Corporation
Harrison, New Jersey
Representative—O. E. Lohrke

Monsanto Chemical Company
1700 Second Street
St. Louis 4, Missouri
Representative—J. W. Newcombe

National Lead Company
Baroid Sales Division
111 Broadway
New York 5, New York
Representative—H. H. Farnham

National Rosin Oil Products, Inc.
1270 Avenue of the Americas
New York City 20, New York
Representative—Richard Bender

Newridge Chemical Company
600 North Wells Street
Chicago 10, Illinois
Representative—T. E. Shine

M. W. Parsons—Plymouth, Inc.
59 Beekman Street
New York City 38, New York
Representative—Herbert Bye

Synthetic Products Company
1636 Wayside Road
Cleveland 12, Ohio
Representative—Garry B. Curtiss

Swift & Company
165th & Indianapolis Boulevard
Hammond, Indiana
Representative—F. H. Beneker

Vegetable Oil Products Co., Inc.
Vopcolene Division
5568 East 61st Street
Los Angeles 22, California
Representative—C. F. Williams

Warwick Chemical Company
Division Sun Chemical Corporation
10-10 44th Avenue
Long Island City 1, New York
Representative—Dr. J. J. Whitfield

Witco Chemical Company
75 East Wacker Drive
Chicago 1, Illinois
Representative—E. F. Wagner

TECHNICAL AND RESEARCH ORGANIZATIONS

Midwest Research Institute
4049 Pennsylvania
Kansas City 2, Missouri
Representative—Dr. M. H. Thornton

Petroleum Educational Institute
9020 Melrose Avenue
Los Angeles 46, California
Representative—G. A. Zamboni

Phoenix Chemical Laboratory, Inc.
3953 W. Shakespeare Avenue
Chicago 47, Illinois
Representative—Mrs. G. A. Krawetz

Sociedade Nacional de Petroleos
Rua D. Pedro V, no. 80
Lisbon, Portugal
Representative—Manuel Corda Boullosa

LITHIUM-BASE MULTI-PURPOSE

INLUCITE 21

Makes All Single-Purpose Greases Obsolete

Write for full details

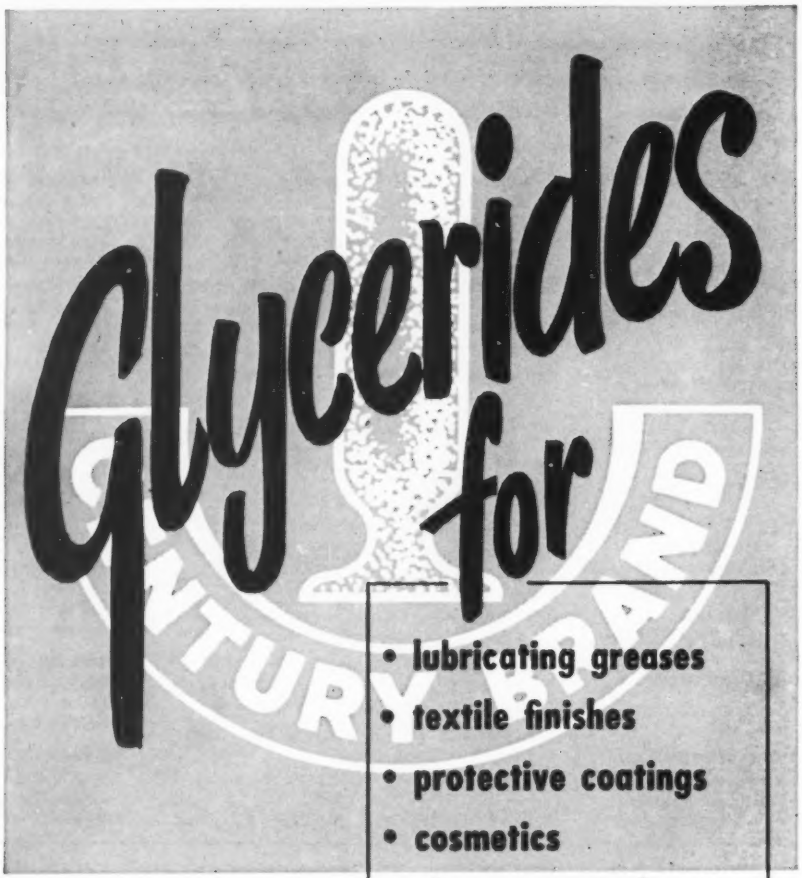
INTERNATIONAL LUBRICANT CORPORATION

New Orleans, Louisiana

Manufacturers of Quality Lubricants

AVIATION • INDUSTRIAL • AUTOMOTIVE • MARINE

With Research Comes Quality • With Quality Comes Leadership



CENWAX G *(hydrogenated castor oil)*

CENWAX G is a glyceride chemically, although physically it resembles a wax. It is a hard, high melting point solid, available in finely beaded form, with practically no taste or odor. Typical applications are in lithium, barium or sodium greases; hot-melt paper coatings; extender for higher priced waxes in polishes. These CENWAX G specifications should suggest other uses:

F.F.A. (as Oleic Acid)	2.0 max.
Acid Number	4.0
Saponification Number	176-184
Iodine Value (WIJS)	1-5
Melting Point (°C)	82-85
Hydroxyl Value	155-165
Acetyl Value	137-148

CENTURY HYDREX 360 *(hydrogenated tallow glyceride)*

This hardened tallow product is available in beads and its good color, high titre and low iodine value particularly suit it for use in certain textile finishes and lubricating greases.

SPECIFICATIONS

Titre	(136.4-140.0 °F) 58-60.0 °C
Iodine Value (WIJS)	1-3
Free Fatty Acid	1-3%
Acid Number	2-6
Saponification Value	190-195
Color 5¼" Lovibond Column (Max.)	15 Yellow-2 Red

W. C. HARDESTY CO., Inc.

Century Stearic Acid Products, Inc.

41 EAST 42ND STREET, NEW YORK 17, N. Y.

PLANT: DOVER, OHIO

IN CANADA: W. C. HARDESTY CO. OF CANADA LTD., TORONTO

Patents and Developments

Greases Containing Modified Montmorillonite

The industry already is familiar with the gelling of organic fluids to form greases by use of modified montmorillonite clay, in which the sodium, or part of it, is replaced by a long chain secondary amine group. Such greases, known as Bentone greases, have been described in the May 1950 issue of THE INSTITUTE SPOKESMAN.

To prepare such a grease, the clay is hydrated in a very dilute dispersion to separate the unit particles, and is purified by super-centrifugation to remove impurities, since most of these clays contain quartz which obviously would act as an abrasive. The reactive sodium atoms then are replaced by organic cations, such as alkyl ammonium.

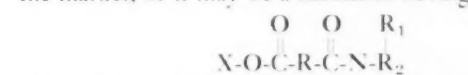
Properties of the resulting Bentone grease may be controlled. For example, use of a short chain alkyl ammonium salt produces a product with slight organophilic properties and retention of a large part of the original hydrophobic and organophilic grease and greatly imalkyl ammonium salt results in increasing organophilic properties. Use of a quaternary ammonium salt with two long chains (16-18 carbons each), gives a completely hydrophobic and organophilic grease and greatly improves heat stability.

The characteristic of such lubricating greases is their resistance to high temperatures. It is practically impossible to melt such greases, and they generally resist melting when heated beyond the ignition point of the oil vehicle.

Such greases are claimed to catalyze rusting of ferrous metals. Also, they are said to lack adequate rust-preventive properties and resistance to oxidation. Furthermore, their structure is claimed to be so rigid as to preclude release of oil from the mass regardless of temperature, thereby resulting in bearing wear. Usual rust inhibitors are claimed to be unsatisfactory for such greases, since they diminish gel strength and do not prevent rusting.

In U. S. Patent 2,640,812 issued to Swan-Finch Oil Corporation, it is held that at least some of the aforesaid difficulties may be overcome by use of a long chain organic salt gelator with the modified montmorillonite in the petroleum lubricant.

The organic salt gelator contains a straight chain of at least 8 carbon atoms and its salt-forming metal is Li, Na, Ca, Ba, or Sr. This organic salt may be a soap found on the market, or it may be a substance having the formula:



where X is an alkali metal, R consists of methylene groups having a carbon chain length of 1-8 carbon atoms, or the group $=C\text{-}CH_2$. R_1 is an aliphatic radical of 4-18 carbons, or other specified organic radicals. These substances and their preparation are claimed to be disclosed in Patent 2,604,449, and they include derivatives of "amic" acids known as "amates."

One example proposes the use of a gelator containing 81% barium stearate with 19% Bentone 34 in an oil vehicle. Another example shows use of a gelator containing 46-75% lithium amate and 25-54% Bentone. Lubricity improvement was demonstrated by using the Falex machine made by Faville-Levalley Corporation, Chicago.

Greases Containing Li-Ca Salts of High Molecular Weight Fatty Acids

A superior high temperature, shear stable, moisture resistant, all-purpose lubricating grease is claimed to be obtained with a mixture of lithium and calcium soaps of high molecular weight fatty acids, in which the preferred mol ratio of lithium to calcium soaps is between 3:1 to 6:1. When the amount of lithium soap is increased beyond an 8:1 ratio, the advantages gained by incorporating the calcium soap decrease markedly, while if the amount of calcium soap is increased above the 3:1 mol ratio, manufacturing difficulties are encountered, and a stable structure is hard to obtain.

In the Standard Oil Development Company Patent 2,641,577, it is pointed out that such greases are very stable to shear breakdown, and they also have high dropping points. They can be made at temperatures as low as 320° F., whereas other lithium base greases require temperatures as high as 430° F. The greases also are less sensitive to manufacturing variables and show decreased aeration when subjected to mixing or shear stresses. They show increased resistance to solvent action of hydrocarbons.

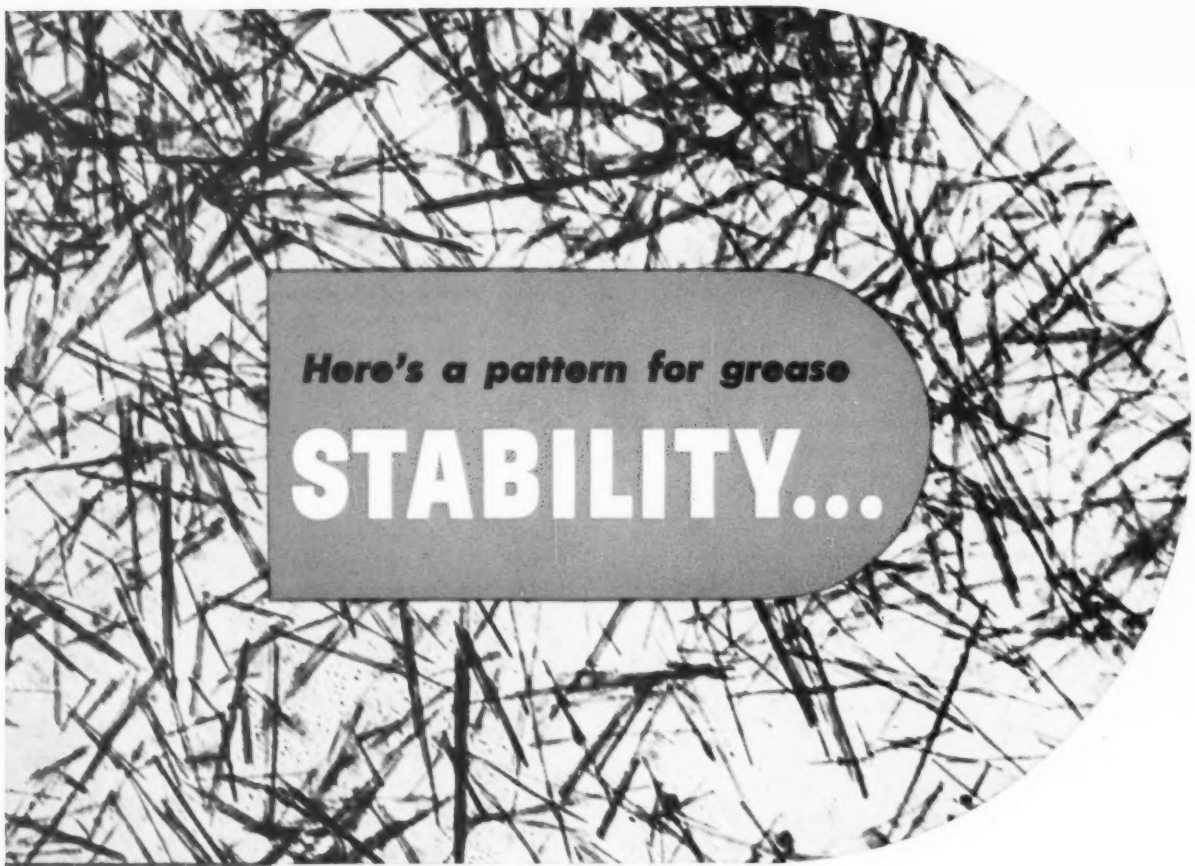
One example of a formulation made according to the invention is as follows:

	Per cent
Hydrogenated fish oil acids having a saponification value of 212	15.00
Lithium hydroxide monohydrate	1.73
Calcium hydroxide (68.0% CaO)	0.82
Phenol extracted Coastal distillate having a viscosity at 210° F. of 37 S.U.S.	12.40
Phenol extracted Panhandle Distillate having a viscosity at 210° F. of 44 S. U. S.	69.21
Phenyl-alpha naphthylamine	0.50
Free acidity calculated as oleic acid (ASTM-D128-47 method)	0.34

Greases Thickened with N-Acyl Amino Phenols

According to Patent 2,642,397, issued to Standard Oil Development Company, lubricating oils may be thickened to form a grease composition by incorporating therein a minor amount of an N-acyl amino phenol in which the acyl group contains 14-22 carbon atoms per molecule.

Compounds suitable for this purpose include N-palmitoyl p-amino phenol, N-n-valeryl-4-amino-3-pentadecyl phenol, etc. They are made simply by admixing the desired acid or acid chloride with the desired p-amino phenol and heating under proper conditions. They can be used to thicken silicone polymer oils to grease consistency.



Here's a pattern for grease

STABILITY...

* SEE PERMAGEL AT WORK *at our exhibit (Space S-57) at the 24th Exposition of Chemical Industries, Philadelphia, November 30 to December 5.*

The colloidal network pictured here is Permagel, the pure inorganic mineral attapulgite. Dispersed in lubricating oils, these needle-like particles result in multi-purpose greases that are both stable and highly resistant to mechanical shear.

What's more, greases thickened with Permagel *remain* stable under a wide variety of operating conditions. They maintain original consistency over a broad range of temperatures and in high shear service as well.

Outstanding mechanical stability is just one of Permagel's many helpful properties. Permagel multi-purpose greases have excellent low temperature pumpability, no melting or dropping points, and show excellent physical stability (because an inorganic agent does the gelling). They have excellent water washing resistance and can absorb more than their own weight in water with little change in consistency.

Permagel's uniformity from shipment to shipment practically insures grease reproducibility. You can select the surfactant best suited to your needs, thus allowing you wide process flexibility. And, all of Permagel's outstanding properties are yours at *unusually low cost.*

Want more information? We'll be happy to forward you detailed technical data and generous samples of Permagel for your evaluation. Or maybe you'd like us to process your oil in our modern grease pilot plant. In either case our technical knowledge is yours for the asking.

ATTAPULGUS Minerals & Chemicals Corporation

DEPARTMENT E

210 WEST WASHINGTON SQUARE, PHILADELPHIA 5, PA.

PERMAGEL

About 2% by weight of N-stearoyl p-amino phenol mixed with 98% of a Mid-Continent distillate of 56 S. U. S. viscosity at 210° F. with a viscosity index of 112, when heated with stirring to 275° F. and allowed to cool, provides a solid grease structure. It is possible to use mixtures with ordinary soaps, such as 4% lithium stearate with 1% N-stearoyl p-amino phenol in phenyl methyl silicone polymer, for example.

News Items

Kessler Chemical Co. is expected to go into commercial production this year on pelargonic and azelaic acids produced under U. S. patent 2,625,558 (Ind. & Engrg. Chem. 7/53 p. 13A).

The multi-purpose grease approach to lubrication (lithium and barium greases)—Link (Product Engrg. 7/53 p. 174).

Westvaco Chemical Division is advertising availability of thiophosphoryl chloride ($PSCl_3$), which should be useful in preparation of E. P. grease additives (Chem. Week 7/25/53).

1953

NLGI Annual Meeting

October 26-28

Edgewater Beach Hotel, 5300 Block, Sheridan Road

Chicago 40, Illinois

Registration Desk

Will Be Open at 3:00 p.m., Sunday, October 25

1953

from Sinclair Research come proven lubricants for all applications

- TURBINES
- STEAM ENGINES
- DIESEL ENGINES
- METAL WORKING
- PLANT MACHINERY
- CONSTRUCTION MACHINERY
- AUTOMOTIVE EQUIPMENT

Sinclair's Research Laboratory, Harvey, Illinois, is dedicated to developing new products and improving the quality of existing products. From this famous laboratory come the Sinclair lubricants which, today, are answering many of the problems of lubrication engineers in all branches of industry. A letter to Sinclair may bring the solution to *your* lubrication problem.

SINCLAIR REFINING COMPANY

600 FIFTH AVENUE, NEW YORK 20, N. Y.

This is to Certify That
THE INSTITUTE SPOKESMAN
because of it's high professional standards, has been designated a
pacemaker
in the 1953 Publications Competition of the
Society of Associated Industrial Editors
NATIONAL LUBRICATING GREASE INSTITUTE
HARRY F. BENNETTS, EDITOR
JOANNE COLEY, ASSISTANT EDITOR
1953

NLGI Wins Top Journalism Award

AGAIN the NLGI has come up with an award. This year we proudly received the award of excellence from the Society of Associated Industrial Editors. A reproduction is on the opposite page.

Competing in the field of approximately 600 publications, the NLGI's official publication won the top award offered for editorial achievement and appearance. It's the general award that industrial publications strive to attain.

Not an award, but a citation, is the reproduction of the "Pacemaker" at the top of the page. Along with the award of excellence, we also received this significant recognition, officially placing our publication as a leader among industrial magazines.

In addition to this outstanding award and citation received this year, NLGI has received two other journalism awards and an award offered trade associations each year. In 1949, the SPOKESMAN won a national journalism award, and in 1950, it received an international award.

In 1952, NLGI received the grand award offered by the American Trade Association Executives. This award is offered annually to the trade association considered to have rendered the greatest service to both its membership and the public. Heading the jury of awards selecting NLGI was the Secretary of Commerce.

Among the jury of awards selecting the SPOKESMAN as the winner of the award of excellence were such individuals as: An editor of **Life** magazine, editor of **Printer's Ink**, the president of an advertising agency, a photographer for **Life** and **Fortune** and the president of a publishing house.

NLGI is proud to receive these outstanding awards from such an outstanding jury.

The Institute Spokesman

National Lubricating Grease Institute

GENERAL AWARDS CONTEST

AWARD OF EXCELLENCE

1953

For Editorial Achievement And Appearance

HARRY F. BENNETTS, Editor

JOANNE COUEY, Assistant Editor

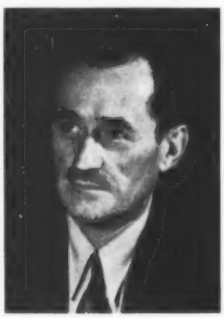
NEW
MEMBER

Bennett Industries, Inc. Joins

NLGI Welcomes Bennett Industries, Inc., as an Associate Member. Company Representative Is S. A. Bennett, President. Technical Committee Member Is H. F. LePan.

The Granddaddy of all their Five-Gallon Steel Pails

The history of the steel pail business goes back a long way. Its beginning started with a woman, who had taken a bankrupt sheet metal job shop and before her death had made it into the largest manufacturer of steel barrels and pails in the world, with three factories—Chicago, New York and New Orleans—and over 2000 employees.



S. A. Bennett

In 1909, Mrs. M. S. Bennett, a widow with three children, was faced with the loss of all of her savings which she had invested in a small sheet metal company known as the Wilson & Friend Co. The creditors were going to throw the firm into bankruptcy, and this meant that she would be entirely wiped out.

She went to the creditors meeting and asked them if they would give her an opportunity to run the business. At the time she was helping out in the office as assistant bookkeeper. The creditors realized that they would get very little after the company had gone through the wringer and gave her the opportunity to take over; that was the beginning of the Wilson & Bennett Mfg. Co., which in 1939, four years after the death of Mrs. Bennett, sold out to the Inland Steel Company.

Mr. Friend and Mr. Wilson both agreed to turn over the stock to her, which of course, was worth nothing at the time. Mr. Friend left the concern but Mr. Wilson was with Mrs. Bennett until his death in 1928. In 1909 when Mrs. Bennett took over, her son, S. A. Bennett, or "Steve" as he is known in the trade, was getting out of high school. He started to work in the factory and went from one job to another in the plant. For many years before the death of his mother, he was general manager of the company.

In 1910 the firm started manufacturing 50-gallon steel drums. They were, at the time, one of the pioneers in the steel drum industry. In 1914 the company was manufacturing a line of steel barrels for gasoline and oil for the paint division of Sears & Roebuck. About this time, Mr. Hoch, head of this division, approached Mr. Wilson and asked him if he could make a 5-gallon steel pail that would hold paint without having to be crated for shipping. He said he had tried to get several of the large can manufacturers interested, but none of them would do anything with it.

Mr. Wilson, with the help of S. A. Bennett, designed the first practical steel 5-gallon shipping container for shipping paint and other liquids. The method of shipping these products before this had been either in square tin cans with a wooden crate, or in round wooden 5-gallon kits; both of these methods were highly unsatisfactory and produced an enormous amount of claims for leakage or breakage.

The first order given to the Wilson & Bennett Co., in 1914, was for 40,000 pails. The picture of one of these pails is reproduced above. From this beginning, the pail business has grown until now there are many factories producing them at the rate of approximately 80,000,000 a year.

About six months after the concern was sold to the Inland Steel Company, Mr. Bennett resigned and started another container manufacturing business, known as the Bennett Mfg. Co. This was in 1939. By 1944 the concern had two plants, one in Chicago and one in New Orleans, and was doing an annual business of more than $4,000,000 a year. At that time Mr. Bennett received a very flattering offer to sell, from the U. S. Steel Corporation. After this, Mr. Bennett stayed with the steel corporation for about two years, then bought a little steel fabricating company in Peotone, Ill., which is a short distance south of Chicago.

This concern had a small steel fabricating plant which had been in business about 50 years. Mr. Bennett bought this out in the fall of 1946. At that time the payroll amounted to

39 people. Since then the size of the plant has been increased by about 400% and the number of employees has grown to over 200. The name of this company was the Continental Bridge Company. Mr. Bennett changed the name to Bennett Industries, Inc.

In addition to the structural business, the company is now manufacturing steel pails, 3-to-6-gallon, for grease, paint and all other products, 300-gallon farm oil and gas storage tanks, and 5-gallon kerosene dome type containers, and has just recently completed a 5-gallon Blitz can contract for the Army, completing the manufacture of over a million and a half of these in the last two years.

Mr. Bennett has invented many features of present day steel barrels and pails.

Associated with Mr. Bennett are several men who have been in the steel container business with him for over 30 years: Ira Flatt, executive vice-president, and H. F. LePan, vice-president in charge of sales.

GET
SOCONY-VACUUM
CORRECT
LUBRICATION

SOCONY-VACUUM

BACKED BY
THE WORLD'S GREATEST
LUBRICATION KNOWLEDGE
AND
ENGINEERING SERVICE

SOCONY-VACUUM OIL CO., INC.
makers of
Gargoyle Industrial Oils and Greases

if your product is listed here...

it will pay to specify one of the BIG 4 in oil and fat chemicals

adhesives
antistatic agents
buffing compounds
candles
chemical intermediates
cosmetics
crayons
cutting oils
detergents
edible fat products
emulsifiers
esters
foundry partings
greases
leather oils
tube oil additives
lubricants
monoglycerides
paper coatings
penetrating oils
pharmaceuticals
plastics
quenching oils
resins
rubber compounding
rust preventatives
shampoos
shaving creams
soaps
stearates
sulfonated oils
textile size
tin and terne plating
water proofing
wax compounds
wetting agents

ADM Sperm Oils

An ideal lubricant by itself or in combination with other oils. Used in sulfurized, sulfonated, and emulsified forms in the lubrication, metalworking, leather tanning, textile and paint industries. Excellent as a rust preventive

Hydrofol Glycerides

Twelve specific types of pure hydrogenated triglycerides made from animal fats, marine oils, and vegetable oils, including Castor Oil. Highest quality; free from impurities. Absolute controlled uniformity. Resist oxidation and decomposition during processing or if stored for a long period.

ADOL Fatty Alcohols

Mixtures of pure alcohols—available in both saturated (ceytl or stearyl) and unsaturated. Made to exacting specifications, ADOLS can now be shipped in large quantities. Eight types available.

Hydrofol Fatty Acids

Distilled and fractionated to give you any one of fifteen different types of hydrogenated fatty acids made from animal fats, marine oils, and vegetable oils, including Castor Oil. HYDROFOL FATTY ACIDS improve quality and uniformity of your products. Types available with Iodine value as low as 1.0 max.

write for
TECHNICAL BULLETINS
ON THE "BIG 4"
HYDROFOL PRODUCTS

Hydrofol PRODUCTS

All available in Tank Cars, Carloads or Less Carloads

PRODUCED IN ANY QUANTITY... SAMPLES TO SHIPLOADS

ARCHER • DANIELS • MIDLAND COMPANY
Chemical Products Division • 2191 West 110th St. • Cleveland 2, Ohio

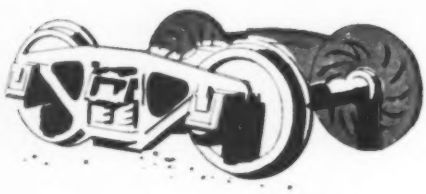
GREATER RESISTANCE TO MECHANICAL BREAKDOWN

in aluminum greases

with **CYANAMID GELLING AGENTS**

In addition to excellent yield and unusually high gel stability, CYANAMID Gelling Agents for aluminum greases give greater resistance to mechanical breakdown.

These benefits are the result of an exclusive CYANAMID process which replaces a small amount of the stearic acid with dimer acid (dimerized linoleic acid), giving CYANAMID Gelling Agents a gel stability far greater than that of aluminum stearate itself.

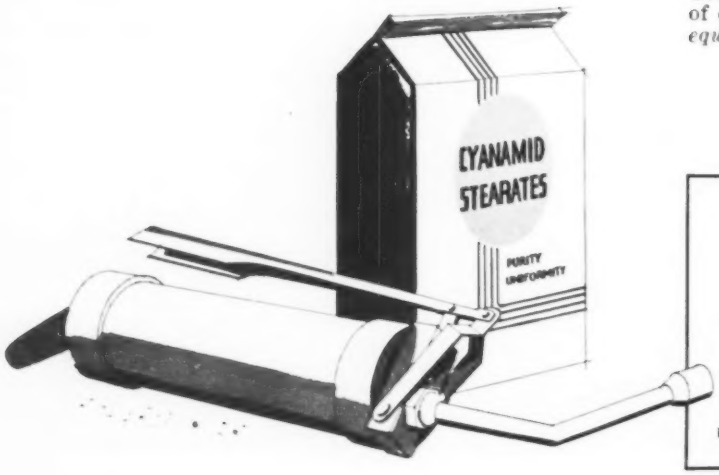


Available in THREE grades:

Cyanamid Aluminum Stearate G-100— Gives maximum gelling . . . *developed for continuous grease-making equipment.*

Cyanamid Aluminum Stearate G-200— *Higher gelling properties in hydrocarbon oils than a conventional di-stearate* . . . gives smooth gel of moderate consistency.

Cyanamid Aluminum Stearate G-300— Gives high yield and excellent stability in a variety of oils . . . *for use in conventional grease-making equipment.*



Write for booklet:

CYANAMID ALUMINUM STEARATES FOR LUBRICATING GREASES

AMERICAN Cyanamid COMPANY

REFINERY CHEMICALS DEPARTMENT

30 ROCKEFELLER PLAZA • NEW YORK 20, N. Y.

In Canada: North American Cyanamid Limited, Toronto and Montreal

"Lubricate for Safety Every 1,000 Miles"

Motorists associate a lubrication job with a crankcase drain just as they associate ham with eggs, hot with cold, green with grass. The association of one with the other, in each case, is perfectly natural—the product of experience. The association of crankcase drains with chassis lubrication is probably the direct result of the American Petroleum Institute's long time, but recently amended policy for crankcase drain, and the chassis lubrication interval recommended by the large majority of car manufacturers, both of which had a common 1,000-mile interval. That, plus effective service station merchandising of the 1,000-mile lubrication job in conjunction with a crankcase drain established the association of the two ideas with the nation's motorists.

Now, with the recently adopted A.P.I. policy of 500-, 1,000- and 2,000-mile intervals for crankcase drains, it's important to emphasize the importance of chassis lubrication as a separate, distinct and highly important service . . . at 1,000-mile intervals.

How do you start emphasizing chassis lubrication as a vital part of car service and maintenance? You start by telling your customers about what chassis lubrication is; what it does; how it benefits their cars.

Crankcase drain is good maintenance for the engine. Engine accessories and other parts of the car demand correct, regular maintenance, too.

Under hood service is an important part of 1,000-mile lubrication job, covers service points whose maintenance is just as vital to the car as periodic crankcase drain.

Use the lubrication chart of the customer's car as a basis. Point out the fitting-equipped points in the front suspension, for example. Admittedly, steering control is highly important. Proper operation of such parts as Control Arms, King Pins, Tie Rods, Connecting Links, Drag Links, etc., depend on proper lubrication applied at the proper time interval.

In the front suspension system alone, there are, on some cars, as many as 25 separate fittings. Each fitting serves not only as a means of introducing lubricant between the bearing surfaces of moving parts but also serves to help seal out dust, dirt, water and other foreign material.

The lubricant itself does much the same. Most fitting-equipped parts rely on the lubricant to form a tough, resilient and slippery seal between the moving metal surfaces in the part.

In most cases, it's normal for some of the lubricant to be forced out of the part by the constant shocks and impacts that are part of every mile that rolls under the wheels.

That's true, especially today, with streets and roads all over the nation far below average. Rutted highways are commonplace. Pot-holes, washboard ridges and hollows plague drivers in most large cities. But, the cars still roll—more and more of them—widening, deepening the holes and ruts.

As the wheels roll into or over the holes and ruts, the tires can absorb only part of the impact. The shock absorbers can dampen only so much of it. The hammering, pounding jar is constant, mile after mile. Front suspension parts, without the protection of proper lubricants, would soon seize or fail in other ways.

Black or Light

METASAP* ALUMINUM STEARATES
make specialty greases 6 WAYS BETTER

Whether you're making black oil greases or clear lubricants, you'll find the use of Metasap Aluminum Stearates will solve your manufacturing problems, cut costs, give you a better finished product. Check these Metasap grease bases for economical production of lubricants with any desired body:

METASAP 598—high gel type for use where high yields are of paramount importance.

METASAP 537—produces a high gel for clear, transparent greases with good lubricating stability.

METASAP GM—gives a medium heavy gel where smoothness is of prime importance.

METAVIS 540—can be used with wide range of mineral oils; produces semifluid, adhesive-type lubricant known as castor machine oil; highly economical.

1. more stable at high temperatures

2. more water-repellent

3. more resistant to centrifugal action

4. smoother in texture

5. wider in applicability

6. more economical

Samples are available for experimental work. Our research and technical staff will be glad to help you select the correct base for any given oil, or achieve any desired effect in a finished grease through use of proper soap mixtures.

*Reg. U. S. Pat. Off.

METASAP CHEMICAL COMPANY, Harrison, N. J.

Branches: CHICAGO • BOSTON • CEDARTOWN, GA. • RICHMOND, CALIF.

Stocks at: Cleveland, Ohio; Louisville, Ky.; Los Angeles, Cal.; Portland, Ore.; Spokane and Seattle, Wash.

METASAP CHEMICAL COMPANY

REG. U.S. PAT. OFF.

Stearates

of Calcium • Aluminum • Lead • Magnesium • Zinc

While cushioning the parts, the lubricant also helps seal them from water, grit, dirt and other substances that could injure the metal. It protects the parts from corrosion and rust at the same time. It's a simple matter to point out the heavy coating of road dirt on the underside of the average car, to illustrate what you mean.

Some cars incorporate covered springs in the front suspension system. These, while not necessarily lubricated every 1,000 miles, are generally checked visibly during the routine of a regular lubrication job. The same is true of covered springs at the rear of the car.

Still using the chart of the customer's car, move toward the rear of the car. Outside of the front suspension system there are plenty of important service points that require regular lubrication at 1,000 mile intervals.

Essential to smooth operation of the transmission, the Clutch Release Bearing is a vital point on some cars. Just as vital, to most cars, is 1,000-mile lubrication of Universal Joints and Universal Joint Splines. Some cars use two Universal Joints, each of them requiring lubrication at the same time interval.

The lubrication chart of a typical customer's car indicates other under chassis service points that are important to safe, smooth driving. Such parts as the Pedal Shaft, Clutch Release Shaft, Master Cylinder Push Rod, Spring Bolts, Spring Shackles, Torque Shaft, Shift Control Bell Crank and others, while not used on all cars, are important on those where they are used and need lubrication at 1,000-mile intervals.

Regular lubrication of the universal joint contributes to efficient transfer of power from engine through power train to rear wheels.

Under chassis service includes proper lubrication for highly essential parts such as the front suspension, universal joints, springs and shackles, many others.

That isn't all that's covered by a good lubrication job. As your lubrication chart plainly indicates, it includes a check of the lubricant level in the Transmission and Differential; both units indispensable to trouble-free driving.

With the lubrication chart, it's easier to explain the idea of how each lubrication job is tailor-made to service accurately and correctly, the specific, and sometimes unique, parts of each model of car.

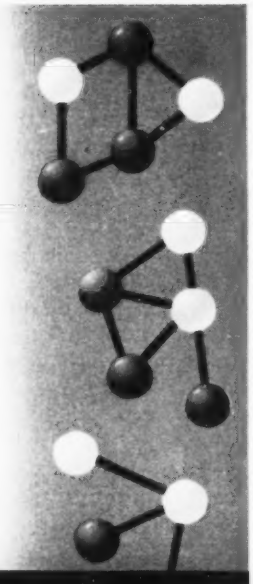
Of course, a lubrication job isn't confined to service under the car. There are service points under the hood, under the floor-board, that are part of a regular lubrication job. Under the hood of a typical group of cars, for example, such parts as the Water Pump, Steering Gear, Distributor, Generator, Gearshift Lever, Manifold Heat Control Valve Shaft and others require lubrication or service at 1,000-mile intervals.

A careful review of the lubrication chart of any car will convince even the most skeptical motorist that chassis lubrication every 1,000 miles, is just as vital to the maintenance of his car as is the care of his engine through periodic crankcase drains at the A.P.I. recommended intervals of 500-, 1,000- or 2,000-miles, depending on how he drives.

The importance of chassis lubrication needs new emphasis, much as it did more than seventeen years ago when CHEK-CHART developed and first publicized the slogan, "Lubricate for Safety Every 1,000 Miles." Constant repetition of the slogan via oil company consumer and dealer advertising will do much to fix the importance of regular chassis lubrication in the motoring public's mind.

Reprinted from—CHEK-CHART SERVICE BULLETIN—June, 1953

By Permission of The Chek-Chart Corporation, 31-33 East Congress Parkway, Chicago 5, Illinois



Ten Miles—or ¼ Million!

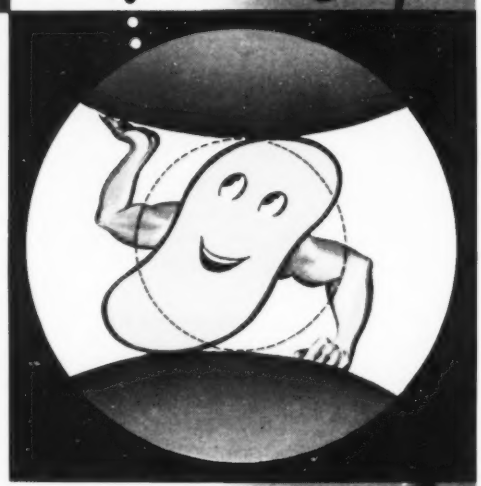
THIS $5000 BEAUTY DEPENDS ENTIRELY ON SCIENTIFICALLY CORRECT LUBRICATING GREASES

As far advanced as it is in automobile engineering, this beautiful convertible is correctly lubricated by Battenfeld products, sold and distributed under America's famous marketing names.

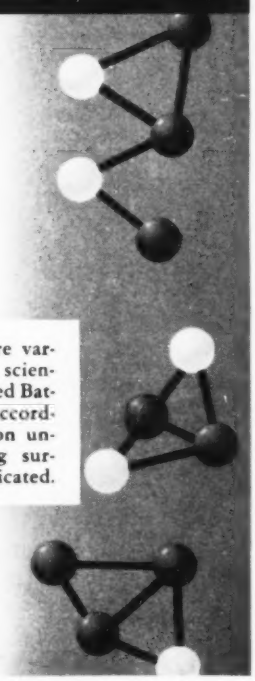
Grease is no longer just "grease". Lubricating greases are compounded products of many types, each with a prime purpose in view. Lubricating greases by Battenfeld are literally *millions of units in protective action!* . . . highly complex units whose molecular structure varies widely according to the job each type of "grease" must do.

Battenfeld is research and production headquarters for lubricating greases sold under the trade names of the nation's most famous marketers and jobbers.

Your inquiry is cordially invited.



"Never shall the surfaces meet!". . . even though pressures reach 90,000 lbs. and tolerances are as close as 1/10,000 of an inch.



Molecular structure varies widely between scientifically compounded Battenfeld greases—according to the condition under which bearing surfaces must be lubricated.

BATTENFELD

international headquarters for
LUBRICATING GREASES
produced for famous marketers
"Business Is Ingreasing"

BATTENFELD
GREASE & OIL CORPORATION

3148 Roanoke Road, Kansas City 8, Missouri
725 Second Ave. No., Minneapolis 5, Minnesota
Box 144, North Tonawanda, New York

PEOPLE in the Industry

R. W. Van Tuyle Elected an Emery Vice-President

At a recent meeting of the board of directors of Emery Industries, Inc., R. W. Van Tuyle was elected a director and to the newly established post of vice-president in charge of manufacturing.

The continued expansion of the company with the addition of more complex manufacturing operations, led to the need for this new position.

Mr. Van Tuyle is eminently qualified for these new responsibilities, and has been associated with Emery for 19 years. During most of that period, except for an extended tour of duty as a major in the Chemical Warfare Service at M.I.T., he was research director. In 1949, he became chemical director, in charge of all research, control, chemical engineering and experimental development activities.

R. W. Van Tuyle

In his new capacity, he adds the responsibility of supervising all chemical manufacturing operations, including the ozone-oxidation plant recently announced by Emery.

U. S. Steel Announces Executive Changes

S. M. Jenks has been appointed to the newly-created post of assistant executive vice-president—operations, United States Steel Corporation, it was announced by H. B. Jordan, executive vice-president—operations.

At the same time, it was announced that John H. Elliott has been appointed vice-president, operations—steel, succeeding Mr. Jenks and E. H. Gott has been made general manager, operations—steel, succeeding Mr. Elliott.

Mr. Jenks, a native of Port Huron, Mich., has been vice-president, operations—steel, since January 1950. He has been associated with United States Steel since 1925, when he began his first job at the American Sheet & Tin Plate Company as an engineer. A graduate of Cornell University, Mr. Jenks held various positions in the engineering department until 1935,

WOOLGREASE

additives for petroleum lubricants

NEUTRAL, COMMON & DESULFURIZED DEGRAS

produced from domestic crudes, available in grades standardized to your specifications

ROBINSON WAGNER CO., INC.

LEADERS IN LANOLIN RESEARCH & DEVELOPMENT

110 EAST 42nd STREET NEW YORK 17, N.Y.

OXFORD 7-0277

when he was appointed chief engineer of the former Carnegie-Illinois Steel Corporation. In 1940, he was named general superintendent of the Gary Works, Gary, Ind., and on April 1, 1949, became manager of operations, Chicago district. He held this position until his appointment to the position of vice-president, operations—steel in 1950.

Mr. Elliott, a native of Ellwood, Ind., studied engineering at the University of Pittsburgh. He started with United States Steel Corporation in 1919, when he became connected with the engineering department of American Sheet and Tin Plate Company. He advanced through various positions in the engineering departments at several U. S. Steel plants until 1940, when he was made assistant general superintendent, Irvin Works. In 1947, he was named general superintendent, and in 1950 was appointed assistant general manager of operations. He held this position until 1951, when he was appointed general manager, operations—steel.

Mr. Gott has been general superintendent of U. S. Steel's Youngstown district operations since March 1951. He is a native of Pittsburgh and graduated from Lehigh University in 1929. He first started with United States Steel in 1937 at Youngstown District Works. He served several years at Clairton Works and in 1941 was transferred to the Gary Steel Works as plant industrial engineer. At Gary, after promotion through several jobs, he was named assistant general superintendent of the service department and in 1951 was made assistant general superintendent at the South Works in Chicago. Mr. Gott held this position until his appointment in 1951 as general superintendent at Youngstown.

Irving Ash Joins Baker Castor Oil Company

Irving Ash has joined The Baker Castor Oil Company, according to a recent announcement made by M. K. Smith, commercial development director.

Mr. Ash will be responsible for sales development and will endeavor to expand still further the many uses for castor oil and its derivatives. He was formerly associated with the Cello Film Corporation and is well known in the paint, varnish and lacquer trade. He has had extensive experience in technical service and as plant chemist.

Swift Names E. O. Carlton To Industrial Oil Sales Staff

E. O. Carlton has been appointed industrial oil sales representative for Swift & Company in the Southwest. He will have his headquarters in St. Louis, Mo. His sales territory will include Missouri, Kansas, Arkansas, Louisiana, Oklahoma and Texas.

Mr. Carlton will succeed W. F. Bridges, who has been transferred to the company's technical products plant at Hammond, Ind.

The new Swift industrial oil sales representative is a graduate of Purdue university, receiving his degree in chemical engineering. He joined the Swift organization in 1949 as a chemist. During the last few years he has been engaged in chemical engineering research at the company's industrial oil research laboratories in Hammond.

Producers of

LEAD NAPHTHENATE

MOONEY CHEMICALS, INC.

INDUSTRIAL CHEMICALS

Phone SUperior 1-8383

2271 SCRANTON ROAD

CLEVELAND 13, OHIO

A. Neil Savee Appointed A G.P.&F. Sales Manager

A. Neil Savee

August K. Paeschke, president of Geuder, Paeschke & Frey Co., Milwaukee, Wis., has announced the promotion of A. Neil Savee to sales manager of the firm's Steel Package Division. This division manufactures small steel shipping containers (pails, drums, kegs, utility cans, etc.) ranging in size from two to six one-half gallons.

Mr. Savee started with G.P.&F. in 1936 as a salesman. In 1946 he was appointed assistant to the president, and in 1949, manager of the company's Bakery Service Division. In June 1950, he became assistant sales manager of the Steel Package Division.

Div. of Marketing Names Nominating Committee

S. H. Elliott, of Standard Oil Company (Ohio), Cleveland, has been appointed chairman of the nominating committee of the Division of Marketing of the American Petroleum Institute.

Announcement of the appointment and membership of the nominating committee was made by R. M. Bartlett, API vice-president for the division, and vice-president of Gulf Oil Corp., Pittsburgh.

The committee will be responsible for nominating members of the general committee, and the program committee for 1954. Election will take place at the annual meeting in Chicago in November.

Members of the committee are as follows:

R. A. Kent, Kent Oil Co., Salina, Kans.; F. M. Moffitt, Ashland Oil & Refining Co., Ashland, Ky.; A. C. Sailstad, Standard Oil Company (Indiana), Chicago; F. L. Whiteley, Whiteley Oil Co., Columbia, Mo.; W. J. Arnold, The Pure Oil Co., Chicago; M. M. Beckes, Socony-Vacuum Oil Co., New York; R. C. Arnold, Gulf Oil Corp., Pittsburgh, Pa.; C. R. Jonswold, Arrow Petroleum Co., Chicago; J. A. Ransford, Tide Water Associated Oil Co., San Francisco; E. V. Weber, Ohio Petroleum Marketers Association, Columbus, O.; W. W. Wright, Sun Oil Company, Philadelphia; W. E. Downing, Independent Oil Men's Association of New England, Boston; E. K. Bennett, Bennett, Inc., Longview, Tex., and H. Earl Clack, H. E. Clack Co., Havre, Mont.

J. A. Brady Appointed To Penn-Petroleum Staff

The appointment of J. A. (Jim) Brady as manager of the lubrication department in charge of sales and application of products, has been announced by James W. Hopkinson, president of Penn-Petroleum Corporation.

Mr. Brady was formerly with Penola Oil Co. Prior to his coming to Detroit, he was employed as lubrication engineer at National Tube Co., Div. of U. S. Steel Corporation.

Mr. Brady is active in the Detroit sections of A.S.L.E. and A.S.I.E. He is now treasurer of A.S.L.E. and a member of the entertainment committee in A.S.I.E.

FISKE BROTHERS REFINING CO.

Established 1870

★

NEWARK, N. J.

TOLEDO, OHIO

★

Manufacturers of

LUBRICATING GREASES

PETROLEUM SULFONATES FOR GREASE MAKING

PENN-DRAKE® PETROSULS

Always uniform, always high in quality, Penn-Drake Petrosuls have many properties useful to the grease maker. In addition to supplying regular products, we will work with you in developing special sulfonates of calcium, barium and other metals.

1878 1953 75TH ANNIVERSARY

PENNSYLVANIA REFINING CO.

BUTLER, PA.

Branches: Cleveland, Ohio and Edgewater, N.J.

DARLING'S

STEARIC ACID
OLEIC ACID
RED OIL
FATTY ACIDS

DARLING & COMPANY Manufacturers

4203 South Ashland Avenue • Chicago

Industry NEWS

Conservation Is Theme Of Oil Progress Week

October 11-17 marks this year's observance of Oil Progress Week. The theme is conservation. In some ways, this may sound like a dull subject, for we are living in an age of science where even new ways to split atoms can cause yawns instead of excitement. Yet, conservation is of vital importance to all of us. When we take time to review the oil industry's record in the field of conservation, the results are anything but dull. They are vivid illustrations of what we as a generation are doing to give to the future more than we inherited from the past.

Conservation is frequently misunderstood. All too often it is thought of in terms of hoarding—like a miser who hides his treasure so that it does no one any good. True conservation is just the opposite. It means making the fullest use of our natural resources —wisely and with an eye to the future, so that these resources are not depleted to the point where they are gone forever.

The oil industry has practiced conservation for a long time. It would be difficult to enumerate all the ways or all the things which oil men do to conserve our precious petroleum supplies. But we can cite a few. Modern technology, such as water-flooding and repressuring, enable oil men to extract the maximum amount of oil from a given field; transporting and processing, especially the latter, get the most out of all that is produced. A good example is modern gasoline. By revising the molecular structure, by blending and compounding, and by cooperating with automotive engineers in design and performance, oil men are producing an amazing fuel. Two gallons of modern gasoline are equal in power and work energy to three gallons of 1925 vintage—an increased value of one full gallon. That's real conservation, a record which oil men can be proud of as they observe Oil Progress Week, 1953.

ADM Offers Wall Chart

A new wall chart of industrial chemicals derived from oils and fats has been issued by the Chemical Products Division of the Archer-Daniels-Midland Company.

This 17″ x 27″ reference sheet charts the composition and specifications of all the standard Chemi-Fats produced by ADM's Chemical Products Division: Seven Adol Fatty Alcohols, 10 Hydrofol Glycerides, 14 Hydrofol Fatty Acids, and 9 ADM Sperm Oil Products.

Shown on the chart in alphabetical sequence are common uses for the company's fat chemicals. Twenty-one sales offices, their addresses and telephone numbers are also listed. The chart is available at no cost to chemical processors, industrial companies, and research laboratories, by writing Archer-Daniels-Midland Company, 2191 West 110th Street, Cleveland 2, Ohio.

A NEW Grade of Aluminum Stearate

Plymouth ALUMINUM STEARATE 941

If you are interested in reducing costs by increasing yields, try Plymouth Aluminum Stearate No. 941. Indications are that this new grade will lead the extreme high-gel field. You will find that No. 941 exhibits the same Versatility, Uniformity, and Dependability that characterizes our No. 801-22. If intermediate yields are desired, Aluminum Stearate No. 941 should be used in conjunction with Aluminum Stearate No. 801-22.

M. W. PARSONS-PLYMOUTH, Inc.

59 Beekman Street New York 38, N. Y.

PLYMOUTH

Houghton Plans Expansion Of Research Facilities

Plans for an expanded research program, including a further addition to its laboratories, have been approved by the board of directors of E. F. Houghton & Co., manufacturers of oils, chemicals and hydraulic leathers, Philadelphia.

An additional floor will be added over the present research laboratory to provide required facilities for the program, and the staff of chemists will be increased. This expansion is particularly aimed at four fields, all of which represent areas of interest consistently covered by this company in past years.

1. A new approach to the project of cutting fluids for modern machine tools, following up recent Houghton developments. There is an ever increasing responsibility on the cutting fluid, it is pointed out, due to higher machine speeds, new alloys such as nimonic and titanium, and new developments in tooling.

2. Further study of chemical surface treatment of metals, including new developments in phosphating compounds, pickling inhibitors and coloring agents.

3. An expanded heat treatment program, including new furnaces and research on new types of molten salt baths for treating steel and non-ferrous metals.

4. Added emphasis on textile oils and synthetic processing agents for the many new man-made fibers now being perfected.

Construction will begin this fall, with the hope of starting on this further research program early in 1954. Houghton's present laboratory was built in 1928 and an addition constructed in 1941.

New Glossary Breaks Down Petroleum Refining Terms

Technical terms and jaw-breaking phrases which oil refiners use day in and day out are defined, pronounced and reproduced in shorthand in a fascinating new glossary just published by the Division of Refining of the American Petroleum Institute.

The glossary is expected to become an invaluable reference manual for busy executives and secretaries alike; and for chemists, laboratory technicians, refinery personnel, editors, writers, and others interested or involved in refining terminology.

Its title is a "Glossary of Terms Used in Petroleum Refining." Handsomely bound in a durable hard cover, the book contains more than 2000 colloquial and technical phrases commonly used in oil refining operations. More than two years of committee work went into the selection of the phrases and their definitions.

The work of the executive and the secretary will be speeded by the phonetics and the shorthand symbols. Instead of groping for the shorthand symbol for such things as "triptane, 2,2,3, trimethylbutane," or spelling "argillaceous," the secretary has only to familiarize herself with the contents of the glossary to be fully prepared.

Hard cover editions of the book may be obtained through Lacey Walker, Secretary, American Petroleum Institute, 50 West 50th Street, New York 20, N. Y., at $6.00 each.

Package Appeal...
Product Protection...

when you use
G.P.&F.
STEEL SHIPPING CONTAINERS
E-Z-FILL GREASE GUN LOADER PAIL
Grease gun can be loaded directly from container. Clean, fast, economical! 25 and 35 pound sizes.
● G. P. & F. makes steel containers for almost every purpose and product. Designed to *sell* as well as *protect*, they are finished in attractive solid colors, or can be lithographed with your own design or trademark. You may order in straight carloads, mixed carloads or smaller quantities.
G.P.F. STEEL CONTAINERS
GEUDER, PAESCHKE & FREY CO.
425 NORTH 15TH STREET • MILWAUKEE 3, WISCONSIN
Manufacturer of MET-L-TOP Ironing Tables

Southwest Adds Property

Southwest Grease & Oil Co., Inc., has just announced an interesting milestone in the steady advancement it has made during the past 20 years of operation. It has just recently completed the transfer of raw materials and containers into three new large warehouses located adjacent to its previous plant property.

This new property acquisition increases the total plant area by approximately 30,000 square feet and will enable Southwest Grease & Oil to accumulate containers previously stored in inconvenient locations throughout the town into its central plant area. The company believes this will result in increased plant capacity and efficiency.

Witco Plans Expansion

Witco Chemical Company, New York, has recently purchased plant facilities in the Los Angeles area and plans to install manufacturing equipment in the near future.

This expansion of Witco's present production facilities has been undertaken to supply the Pacific Coast area locally instead of meeting requirements by shipment from distant plants. Increasing sales of Witco products on the West Coast has made this a logical development in Witco's expanding manufacturing program.

Economics Primer Offered

The Economic Research Department of the U. S. Chamber of Commerce has issued a set of 17 pamphlets in the form of an Economics Primer. It is designed for reading by the intelligent layman and particularly for setting up local Economics Study Groups.

Each pamphlet includes discussion questions and suggested further reading.

The 17 pamphlets include:

- The Mystery of Money
- Control of the Money Supply
- Money, Income and Jobs
- National Income and Its Distribution
- Progress and Prosperity
- Sustaining Prosperity
- Demand, Supply and Prices
- Prices, Profits and Wages
- Why the Businessman?
- How Competitive is the American Economy?
- Understanding the Economic System and Its Functions
- Spending and Taxing
- Taxing, Spending and Debt Management
- Labor and the American Economy
- Individual and Group Security
- International Trade, Investment and Commercial Policy
- Ethics of Capitalism

(The set is available for $6.00)

Two leaflets, WHY DISCUSS and WANTED: MEN WHO KNOW, explain the Primer. They tell why and how to set up discussion groups. They are available upon request from the Economic Research Department, Chamber of Commerce of the United States, Washington 6, D. C.

If you would like to know more about such a study group or participate in one, just get in touch with your local Chamber or the Chamber of Commerce of the United States.

TOP QUALITY

Manufactured only from carefully selected basic raw materials.

TIME PROVEN

Essar Grease Lead has given lubricant formulators a reliable component for highest predictable results

For Further Information, Write, Wire or Phone—

Fred'k A. Stresen-Reuter, Inc. 2113 MEDILL AVENUE CHICAGO 47, ILLINOIS

FUTURE MEETINGS

OCTOBER, 1953

15-16 Petroleum Marketers Assn. of Texas (annual meeting), Adolphus Hotel, Dallas Texas.

19-20 Independent Petroleum Assn. of America (annual meeting), Texas Hotel, Ft. Worth, Texas.

19-20 South Dakota Independent Oil Men's Assn., St. Charles Hotel, Pierre, S. D.

19-21 American Standards Assn. (4th National standardization conference, 35th annual meeting), Waldorf-Astoria Hotel, New York, N. Y.

19-21 American Institute of Mining and Metallurgical Engineers (petroleum branch, fall meeting), Dallas, Texas

19-23 National Safety Council, Conrad Hilton, Congress, Morrison, Sheraton, Chicago, Ill.

22-23 Western Petroleum Refiners Assn. (regional meeting), Garrett Hotel, Eldorado, Ark.

26-27 Pennsylvania Petroleum Assn. (fall convention), Pocono Manor, Pocono Manor, Pa.

26-27 American Petroleum Institute (Division of Refining, Committee on Training), Muehlebach Hotel, Kansas City, Mo.

26-28 National Lubricating Grease Institute (21st annual meeting), Edgewater Beach Hotel, Chicago, Ill.

26-28 American Petroleum Institute (Division of Refining, Committee on Analytical Research), Broadmoor Hotel, Colorado Springs, Colo.

27 Assn. of Consulting Chemists and Chemical Engineers (annual meeting), Belmont Plaza Hotel, New York, N. Y.

28-29 Independent Oil Compounders Assn. (6th annual meeting), Edgewater Beach Hotel, Chicago, Ill.

29-30 Society of Automotive Engineers (international production meeting), Royal York Hotel, Toronto, Ontario, Canada.

NOVEMBER, 1953

2-4 Society of Automotive Engineers (national transportation meeting), Conrad Hilton Hotel, Chicago, Ill.

2-4 American Oil Chemists' Socy. (27th fall meeting), Sherman Hotel, Chicago, Ill.

3-4 Society of Automotive Engineers (national diesel engine meeting), Conrad Hilton Hotel, Chicago, Ill.

4-5 Nebraska Petroleum Marketers (annual convention), Paxton Hotel, Omaha, Nebr.

4-6 Socy. of Automotive Engineers (national fuels and lubricants meeting), Conrad Hilton Hotel, Chicago, Ill.

5-6 American Assn. of Petroleum Geologists (Pacific sectional annual meeting), Biltmore Hotel, Los Angeles, Calif.

9-11 The Geological Society of America (annual meeting), Royal York Hotel, Toronto, Ontario, Canada.

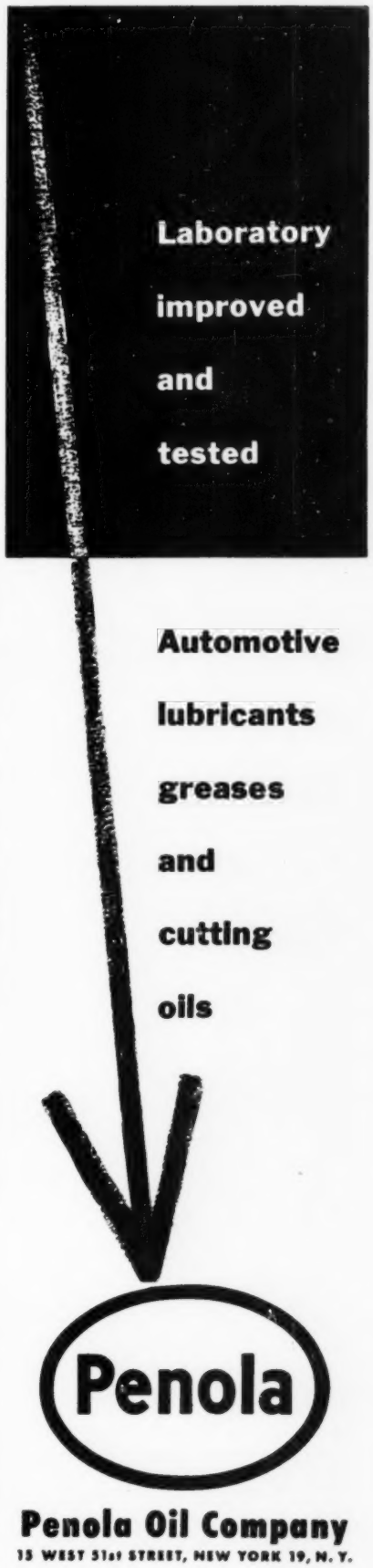
9-12 American Petroleum Institute (33rd annual meeting), Conrad Hilton Hotel and Palmer House, Chicago, Ill.

16-17 Packaging Institute (petroleum packaging committee), New York, N. Y.

19-20 National Assn. of Corrosion Engineers (western region), Los Angeles, Calif.

29-Dec. 4 American Society of Mechanical Engineers (annual meeting), Statler Hotel, New York, N.Y.

30 to Dec. 5 24th Exposition of Chemical Industries, Commercial Museum & Convention Hall, Philadelphia, Pa.



TWENTY YEARS OF LUBRICANT MANUFACTURING EXPERIENCE

SOUTHWEST Good GREASE

CELEBRATING OUR 20th ANNIVERSARY

has available for YOU tailormade to fit your requirements a complete line of HOMOG-ARATED MULTI-PURPOSE LUBRICANTS

FOR ECONOMY

FOR OUTSTANDING ALL-RANGE PERFORMANCE

FOR HEAVY-DUTY INDUSTRIAL AND AUTOMOTIVE SERVICE

FOR THAT HIGH-TEMPERATURE REQUIREMENT

Call Upon Southwest

CODE

MULTI-LUBE No. 0—1—2

A Highly Controlled, Commercially Proved Product — 5400, 5405, 5404

MIL-LITH *Amend. 2 and Amend. 1*

Fully Conforming with the Exacting Specification MIL-G-10924 — 5401, 5430

STABL-LITH—h. d.

Fully Meeting ASTM Norma Hoffman Oxidation Stability Test — 5410

BENTO-LUBE 0—1—2—3

Relatively Immune to Temperature Changes at All Ranges — 5453, 5451, 5452, 5450

FOR A DEPENDABLE SUPPLIER READY TO MAKE PROMPT SHIPMENTS OF ASSORTED MULTI-PURPOSE GREASES

BUY LARGE, MODERN, VERSATILE PLANT STANDS READY TO SERVE YOU

WIRE, WRITE OR TELEPHONE FOR SAMPLES AND FURTHER INFORMATION

MANUFACTURERS OF PETROLEUM LUBRICATING GREASES AND SPECIALTIES

SOUTHWEST GREASE & OIL CO., INC.

220 WEST WATERMAN • WICHITA 2, KANSAS

SOUTHWEST Good GREASE

NILES

Steel Pails and Drums

FOR OILS, GREASES, ETC.

No. 9 Niles Pail with lug cover and pour spout.

NILES STEEL PAILS

ordinarily are supplied with bail handles. Fabricated from black steel—outside painted or lithographed to order. Removable tops with lug covers, with or without pour spouts. Also in tight head style. 3½ to 6 gallon capacities.

• • •

NILES STEEL DRUMS

55, 30 and 15 gallon capacities; and 100 lb. grease drums. Full open head or Bung type. Painted or fully decorated. Interior lacquered if desired.

100-lb. Niles Grease Drum with 14 inch full open top lug cover. Also made with 9 inch lug cover in center of head.

Write for literature and quotations

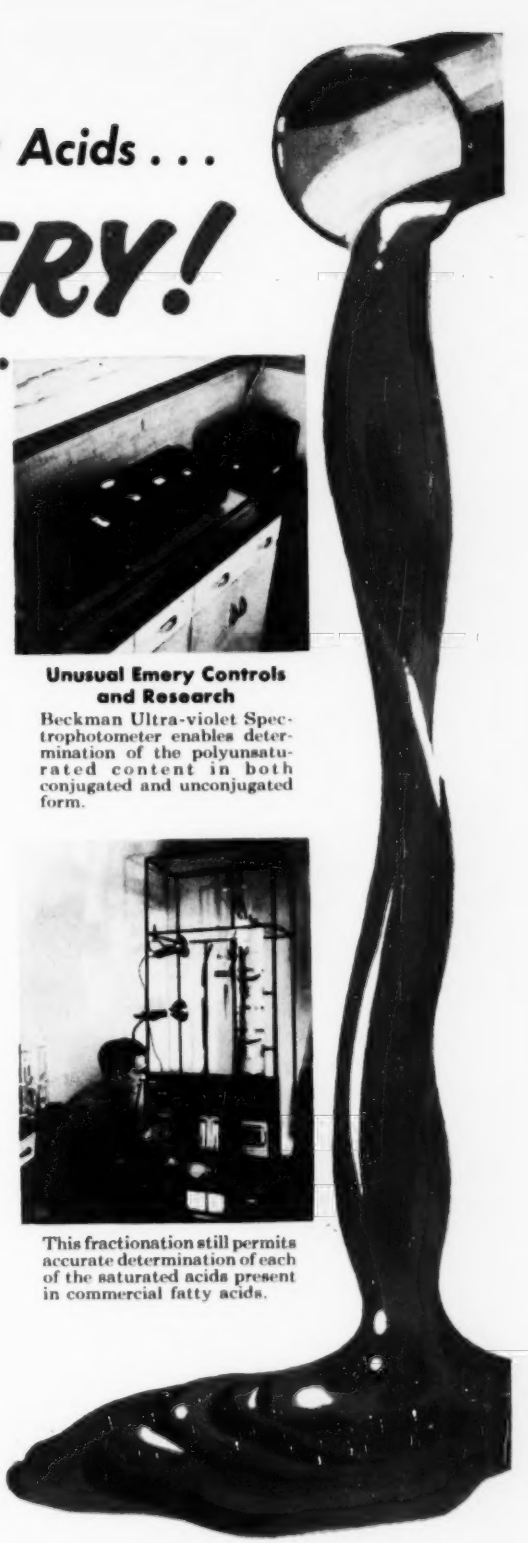
REPUBLIC STEEL

PRESSED STEEL DIVISION
REPUBLIC STEEL CORPORATION
465 Walnut Street • Niles, Ohio

Greasemakers—

get the facts about Fatty Acids . . .

CALL EMERY!



Profit from Emery's Store of Information . . . the Result of Continuing Research on the Use of Fatty Acids!

Fatty Acids are complex. Nature mixes them up—but they can be selectively separated to segregate specific compositions for specific uses.

This means the performance of fatty acids in lubricating greases can be predicted only if the function of composition is related to performance. The work done by Emery in studying the effect of such components as saturated acids, unsaturated acids, polyunsaturated acids, conjugated and nonconjugated acids, isomers, and unsaponifiables, is a reasonable basis for suggesting you turn to Emery for information on fatty acids.

Besides, you can select from Emery's complete line of Fatty Acids, that product best suited to your needs. Or you can turn to Emery's Development and Service Department for suggestions to adapt a product to your individual problem, or for modifications of standard products that better fit your specific use.

Choose from a complete line of these fatty products:

Emersol Stearic Acids
Emersol Oleic Acids
Hyfac Hydrogenated Acids and Glycerides
Vegetable Fatty Acids
Animal Fatty Acids
Dimer Acid (dilinoleic acid)
12-Hydroxystearic Acid
Hydrogenated Castor Oil
Azelaic and Pelargonic Acids
Diesters for Synthetic Greases

Unusual Emery Controls and Research

Beckman Ultra-violet Spectrophotometer enables determination of the polyunsaturated content in both conjugated and unconjugated form.

This fractionation still permits accurate determination of each of the saturated acids present in commercial fatty acids.

See us at Booth 718, 24th Exposition of Chemical Industries Commercial Museum, Philadelphia, Nov. 30 to Dec. 5, 1953.

Emery

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

EMERY INDUSTRIES, INC.

CAREW TOWER, CINCINNATI 2, OHIO

Export: 5035 RCA Bldg., New York 20, N. Y.
Branch Offices: 3002 Woolworth Bldg., New York 7, N. Y.
401 N. Broad St., Philadelphia 8, Pa.
221 N. LaSalle St., Chicago 1, Ill.
187 Perry St., Lowell, Mass.
420 Market St., San Francisco 11, Cal.

Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles

Containers that *Protect* your product ALL THE WAY

Sturdy steel drums and pails—made with care and accuracy in every detail make certain that your product quality receives protection *all* the way to its destination. They make certain that your products remain safely sealed through the various conditions of handling and shipping.

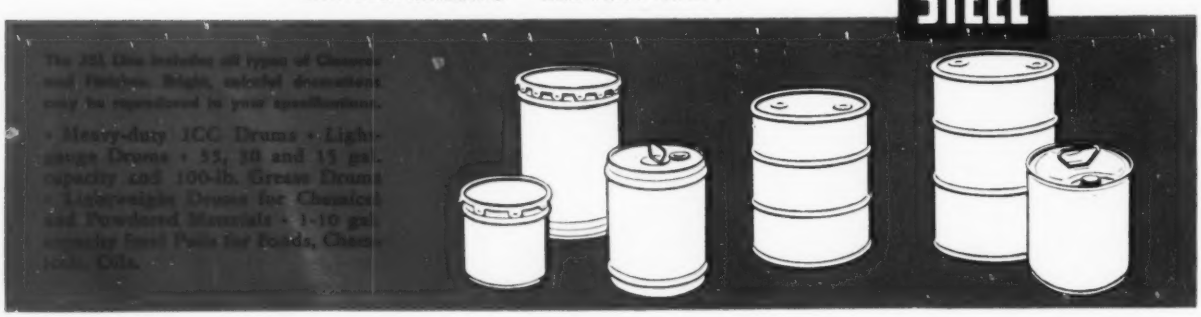
That's why J&L Steel Drums and Pails are standard packaging specifications for many leading product brands. They have proved through years of dependable service that they meet the most rigid tests for durability.

Plants for the manufacture of J&L Steel Drums and Pails are located in leading industrial centers to assure quick, efficient service to meet your requirements. Call the nearest J&L office . . . or, contact our headquarters office in New York City.

PLANTS: Bayonne, N.J. . . . Cleveland, Ohio . . . Philadelphia, Pa. . . . New Orleans, La. . . . Kansas City, Kan. . . . Atlanta, Ga. . . . West Port Arthur, Texas . . . Toledo, Ohio

JONES & LAUGHLIN STEEL CORPORATION
Container Division
CHRYSLER BUILDING • NEW YORK 17, N. Y.

J&L STEEL



phase 4:

Foote's new lithium chemical plant

THINKING AHEAD

The end and the beginning are near at hand. Quantities of lithium hydroxide are now being shipped from Foote's new lithium chemical plant at Sunbright, Va.

With the realization that Sunbright is approaching full production, your plans for multi-purpose grease manufacture can be accelerated.

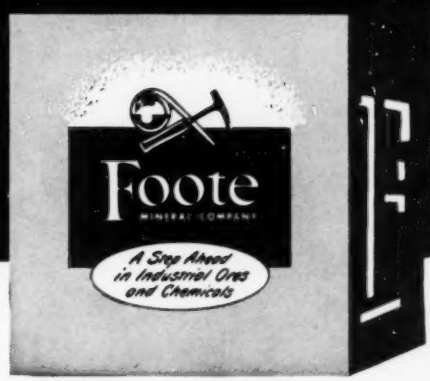
phase 3—Pilot plant operations of an exclusive lithium process developed by Foote.

phase 2—Kings Mountain, N. C.—Mining largest known deposits of spodumene.

phase 1—Continuing Foote research...finding new and improved uses for lithium chemicals.

"Industry Looks at Lithium"

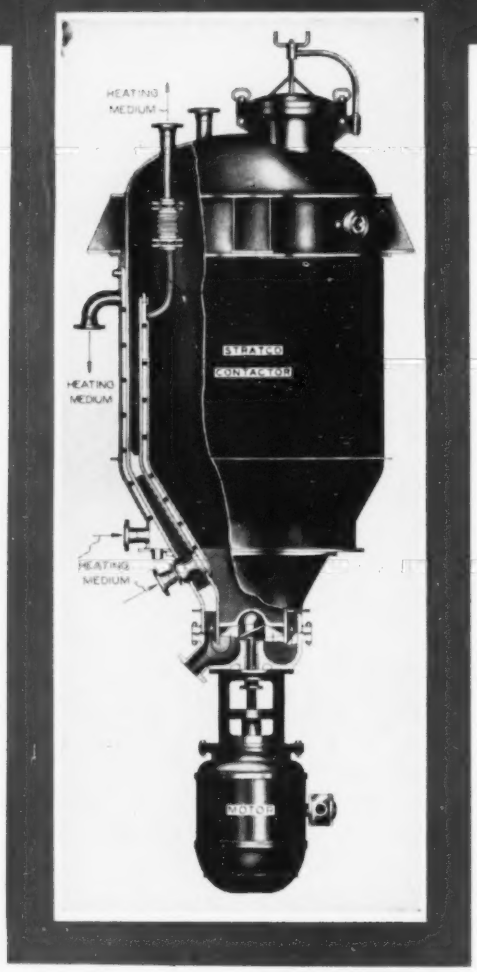
...a new, informative brochure on the properties and industrial uses of lithium and its compounds. Write for your copy today.



FOOTE MINERAL COMPANY

402 Eighteen W. Chelten Building; Philadelphia 44, Pa.
RESEARCH LABORATORIES: Berwyn, Pa.
PLANTS: Exton, Pa.; Kings Mountain, N.C.; Sunbright, Va.

STANDARD EQUIPMENT



For the Economical Production of Uniform Greases

STRATCO
Reg. U. S. Pat. Off.

ENGINEERED and EQUIPPED GREASE PLANTS

Stratco installations revolutionize grease making . . . and provide an easier, more economical method of producing uniform greases.

Progressive manufacturers have built modern Stratco plants—some in service since 1929. If yours is not one of them, let us show you how it can be modernized, possibly using much of your present equipment.

Soap and Grease Contactors
Process Kettles
Oil Circulation Heaters
Specialized Engineering Services

STRATFORD ENGINEERING Corporation

Dierks Bldg. *PETROLEUM REFINING ENGINEERS* Kansas City 6, Mo.